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LOW BACKACHE FROM THE ORTHOPÆDIC POINT OF VIEW.[1]

By E. B. M. VANCE, M.B., Ch.M. (Sydney), M.Ch.Orth. (Liverpool),

Honorary Orthopædic Surgeon, Royal South Sydney Hospital; Honorary Assistant Orthopædic Surgeon, Royal Prince Alfred Hospital, Sydney.

ONE feels it is an honour to be one of those asked to address you this evening, and the more so because the subject, "Low Back Pain", chosen for us is difficult, important and interesting.

It is difficult because, as you know, there are a very great number of possible causes of low backache. It is difficult because of the complications due to referred pain. An affected back may cause a pain in the leg, and an affected uterus may cause a pain in the back. It is difficult, too, because in the world of the industrial wage-earner a bad back all too often gets an added factor of anxiety neurosis, leaving us the task of sifting out how much is organic and how much functional in the complaint.

It is important because it is a common trivial ailment. In the past there has been a tendency for us to say to one complaining of a bad back: "You haven't got fibroid uterus" or "You haven't got a malignant prostate, therefore you can't have a bad back and you must be neurotic".

It is specially interesting because one begins to sense that in spite of the complexities of the subject there may be a deep underlying common factor in the majority of cases of low back troubles, just as there is in foot troubles; that this factor is poise and muscle balance; and that the troubles come when this balance is disturbed and go when it is restored.

Ætiology.

One would like to elaborate this theme, but one is in duty bound to survey the whole field first. To this

[1] Read at a meeting of the New South Wales Branch of the British Medical Association on April 26, 1934.

end I am going to enumerate the common causes of backache as follows: (i) congenital malformation of bones, (ii) traumatic and post-traumatic causes, (iii) arthritis and other pathological changes in bones and joints, (iv) referred pain, (v) postural errors, (vi) a combination of causes.

Congenital Malformations of Bone.

(*a*) The radiologist's shadow show has taught us what a lot of queer abnormalities we can meet in the lumbar vertebræ. With a touch of exaggeration someone has said: "There is no such thing as a normal fifth lumbar vertebra." The bodies of vertebræ ossify from two separate centres, which may be alongside, superimposed or even one behind the other. When these two do not ossify equally or when they fail to fuse, then an irregular vertebral body results. If the irregularity is from side to side we get a localized scoliosis; if it is irregular antero-posteriorly we may get a localized kyphos.

(*b*) The articular processes and their facets show great variety in shape and in the setting of the planes of their surfaces. Normally the lumbar facets are placed vertically in an antero-posterior plane and allow only the slightest lateral bending movements. In the dorsal region the facets are set more in the lateral plane and allow side-to-side movement. Sometimes the lumbar facets may be asymmetrical; and such a condition would permit of asymmetrical movements (or a symmetry in the range of movement from side to side), which might be discovered on clinical examination and which would lead us into error of diagnosis unless we had the X ray film to guide us.

(*c*) In the neural arches the principal anomaly is lack of fusion between two halves of the arch; that is, *spina bifida occulta*, a condition which may be suspected if on clinical examination we see a small lipoma, a tuft of hair, or a central dimple. The association between *spina bifida occulta* and claw feet is common, and the presence of one should remind us to look for the other.

(*d*) The epiphysis for the spinous process may remain separate and give rise to a distinct bone. Long downward-pointing spinous processes in the lumbar spine are abnormal. If they are present, they limit flexion of the spine and tend to produce a fixed lumbar lordosis. They may have painful bursæ between their tips, which may be the site and the cause of pain in the back.

(*e*) The transverse processes of the fifth lumbar vertebra are the cause of much controversy as to their rôle in causing low back pain and referred pain down the leg. They may be fan-shaped and short and articulate with the sacrum, or they may be very long with the ilium.

Theoretically these sacralizations of the fifth lumbar transverse processes, as they are called, are capable of causing trouble. If the long one impinges on the ilium it may act as a fulcrum in movement and force apart the sacro-iliac joint surfaces. If the short one impinges on the sacrum it may force apart the lumbo-sacral joint. Either of them may cause erosion and a painful pseudarthrosis. Either of them may cause a hyperplasia of the surrounding tissues involving the nerves passing over them. These things may occasionally happen, but these cases are the ones in which one might ask oneself: "As the abnormality has been present since birth and as the pain has only recently come on, is not the pain more likely to be due to some imbalance, some poorness of poise, and should we not make ardent efforts to restore this balance before suggesting the cutting out of the transverse process?" And yet there are cases in which operation is indicated as a last resort. There is the case in which the pain is ceaseless and intractable; it is local to the site of the tip of the transverse process and referred down the leg in the distribution of the fourth lumbar nerve, that is, on the inside of the calf of the leg. Such a case, which has resisted all efforts to rebalance by supports and manipulations and exercises, must be allowed to be one demanding operation.

(*f*) The lumbo-sacral angle is normally 120° from the upright, but is often very much more than this, and the joint is liable to stress because it is at the junction of a fixed with a mobile part of the spine.

(*g*) There may be, instead of the usual five, either four or six lumbar vertebræ, or four and a half or five and a half. These variations are due to the caprice of the embryonic limb-bud starting to grow either a little further forward or a little further back than normal.

Now what part have these bone malformations in causing backache? Frequently, most frequently, they exist without any symptoms. But, given a back with these abnormalities and then assume at school or at work an habitually faulty posture, then trouble is likely to ensue more quickly than it would in a normal back. The same applies to small traumata. These would clear up better in a normally boned back than in the abnormally.

The treatment of such backs means treating the posture or the trauma rather than attempting to remove by surgical means any congenital error the X ray examination may have disclosed.

Traumatic and Post-Traumatic Causes.

Under the heading of traumatic and post-traumatic causes we must list the following: (i) ligamentous and muscular strains, (ii) sacro-iliac sprain, (iii) lumbo-sacral sprain, (iv) spondylolisthesis, (v) fracture of a lumbar body, (vi) fracture of a transverse process, (vii) Kümmell's disease.

We begin here with the simpler.

Ligamentous and Muscular Strains.—Ligamentous and muscular strains are caused by violent over-stretching. Pain is sudden and only partly relieved by rest. It may be impossible to be sure whether either or both are involved, but if the pain is increased by active muscle movement at the site

of the maximum tenderness, then muscle sprain can be diagnosed and a prognosis of three weeks' rest given. If passive movements elicit the greatest pain, then ligamentous sprain is the cause and six weeks' rest is required. These heal up nicely if no re-sprain is allowed by using the back. Firm "Z.O." strapping for the lighter cases or recumbency in a light plaster shell, followed by graduated exercises, is the way out.

Sacro-Iliac Sprain.—In my local experience sacro-iliac sprain seems to be gaining the position of the most frequent and important of the causes of the low back pain and sciatica. Most of the books now contain Smith-Petersen's table of its distinguishing characters as compared with lumbo-sacral strain, to which one refers you for fuller information. In brief they are as follows:

Sacro-iliac sprain is caused by a twisting wrench, for example, when a person carrying a weight trips and makes a violent effort to recover. Pain is felt over the joint, and tenderness is present there also. Referred pain is felt along the posterior aspect of the thigh, in the adductor of the thigh region, and in the sciatic notch. There is often wasting of the thigh muscles. The attitude in standing is that the body is inclined away from the affected joint, the lumbar vertebra assuming the so-called sciatic scoliosis. On rising from sitting, the spine is held rigid and the hands are used. In forward stooping flexion of the trunk is avoided, but the patient can stoop readily in the sitting position. On the patient attempting to raise the straight leg, pain is felt in the sacro-iliac joint before the leg is half way up or, in other words, as soon as the shortened hamstrings put strain on the pelvis. Such a person is relieved as soon as a firm pelvic band is applied. The local and the referred pain subside. But he requires further help. His attitude and posture will remain faulty, partly because of old adhesions in the ligaments round the joint or in the muscles adjacent, partly because the *erector spinæ*, the *gluteus maximus*, the hamstrings and the ilio-psoas muscles have been on guard so long that they have become adaptively shortened. To get rid of these faults it is better to manipulate *secundem artem* under anæsthesia. There still remains the task of restoring the musculature back to its normal symmetrical contracture and relaxation. This can be accomplished by very active exercises begun immediately after the manipulation and carried out for a fortnight with the help and supervision of the masseuse and continued after that at home.

One knows from one's own and from the experience of other men that a certain number of these cases come to operation, namely, the operation of fixation of the sacro-iliac synchondrosis by the Smith-Petersen method. But one goes on year after year seeing a goodly number of these sacro-iliac cases. Sooner or later most of them seem to clear up with the belt, manipulation, and reeducation method, either alone or in combination. However, who knows whether there is a case or the usual series of three cases just waiting around the corner to force one to operate.

In lumbo-sacral strain there is a history of force applied from above with the spine in flexion; stout heavy persons are the more liable to it. Pain and tenderness are felt at the lumbo-sacral junction, and referred pain is felt on the outer side of the leg, the dorsum of the foot and the sole of the foot. Bent leg raising elicits pain at the site of the affected joint. One follows a similar course here of brace manipulation and exercises, as in the sacro-iliac joint. The brace is more solid and comes up higher than the one used in sacro-iliac trouble. As with sacro-iliac there are the cases of lumbo-sacral trouble which will require the Albee's bone graft to fix the joint.

In regard to this question of operation, I consulted Dr. Charles Littlejohn, of Melbourne, and he replied as follows:

1. I am operating less frequently for low backache, mainly, I think, because at the hospital all such cases pass through my hands and I am able to direct mobilization treatment. The older, *i.e.*, of longer standing and recurrent cases, however, still come fairly frequently to operation. In private also I am seeing cases earlier and also getting more of them better by manipulation and exercises.

2. I think it gets easier to pick the right ones, and I always try to prophesy beforehand how any case is going to go. But all cases are subjected to manipulation first if there seems any possibility of cure by that method.

After manipulation they get a course of exercises and if they are not "cured" in six weeks the advisability of operation is discussed.

In the presence of definite X ray changes—sclerosis, false cyst formation, etc.—I am inclined to cut short the probation period unless material improvement is obtained fairly quickly.

Spondylolisthesis.—Spondylolisthesis next claims our attention. This is only doubtfully a traumatic condition. It appears that in persons with an exaggerated lumbo-sacral angle the articular facets may gradually wear away and allow forward slipping to occur, or there may be a defect in the neural arch which allows the body alone to move forward and that these may be brought to notice by a trauma.

Two types are described: unilateral slipping with paralysis, bilateral slipping with mild symptoms.

The appearance of the back is characteristic. The trunk seems unusually shortened and there is a transverse fissure in the fat just above the iliac crests. Then there is the waddling gait, something like that of a person with a bilateral congenital hip dislocation. In its milder forms it is common in women—because the lumbar lordosis is common in women—and then its main importance is to the obstetrician.

Fracture of a Lumbar Body.—Fracture of a lumbar body may possibly pass unnoticed until a kyphos develops in some months' time.

Kümmell's Disease.—Kümmell's disease is the crumbling collapse of a vertebral body coming on years after injury.

Fracture of a Transverse Process.—Fracture of a transverse process occurs either by direct or indirect violence and should be treated as a ligamentous strain would be, except that the time for beginning active exercise should be a few weeks later. Patients so affected are specially prone to develop an egocentric "inlook", and it would appear wiser not to acquaint the average man that he has a fractured transverse process or a "fractured spine" if you can possibly avoid doing so.

Pathological Changes in Bones and Joints.

We come now to pathological changes in bones and joints, and arthritis here heads the list in frequency and importance. The lower part of the spine is a great place to find osteophytes. They grow from margin of vertebral bodies and from margin of sacro-iliac joints. When we have a low back pain to describe we are wont to say: "Ah, there's the cause" when the skiagram shows us an osteophyte; and we diagnose osteoarthritis. But contrarily we very often see, in skiagrams taken for other purposes, the spine studded with osteophytes, and there has been no complaint of pain—in fact, the man has been at hard work every day. Then there is the man who has had some comparatively trivial injury and after three weeks of partial recumbency finds his back very stiff and painful. We examine him with X rays and find he has abundant large osteophytes in the usual sites. Again we say: "Ah, there's the cause of his stiffness—spondylitis." As the space between the vertebral bodies is filled with fibro-cartilage, it really cannot properly be called a joint, and therefore osteophytes at this site cannot properly be regarded as causing osteoarthritis. A new name, "spondylosis", has been suggested, and will perhaps clarify our ideas. The only true joints round the lower part of the spine are those, one on each side, where the articular facet of the one meets the corresponding facet of the other.

It is here that one should look for X ray evidence of arthritis proper; and, if sought, the cause of an acutely painful back will there be displayed in an irregularity and fuzziness of the joint in contrast to its normal clear-cut outline. Such a fuzziness, accompanied by the clinical symptoms of acute pain and muscle spasm in the *erector spinæ* is one of the conditions calling for the most complete rest, in a jacket in recumbency first and later in a jacket ambulating. Such a case calls for a thorough search for focal sepsis. I prefer this to be done at the hands of the physician.

The other osteophytes may or may not cause any stiffness or pain in the back itself, although they are very liable to enforce pressure on the nerves in relation to them and thus to cause sensory symptoms anywhere in the parts subserved by the nerves. Bowel and pelvic organ symptoms may thus be simulated.

When an osteophytic back or, to use the new term, "spondylosis", displays a true muscle spasm at every attempt of the patient to move, then it should be rested in a jacket. When, however, the osteophytic back (and this applies especially to those which recent trauma has rendered somewhat stiff) has some degree of free and comparatively painless movements, then such a back does well with manipulation and gradually increasing active exercises.

Other specific infections of the spine, such as tuberculosis, syphilis and osteomyelitis, cannot be described in the time available, but neoplasms, especially the secondary carcinoma, though rare, should be mentioned and always kept in mind.

In this category comes the acute attack of lumbago and the chronic fibrositis, due to an infection of the muscle sheaths, tendons of insertion, and fascial bands. These lesions are characterized by the fact that, though the back can be bent without inconvenience, the effort to straighten up is intensely painful. Once in ten years I have seen a case of typhoid spine with a thickening of the bone on the lateral aspects of the bodies of the affected vertebræ.

Referred Pain.

In such a general survey as I am attempting one must make mention briefly of the rôle of the referred pain as the cause of backache. Under this heading come the gynæcological problems here to be dealt with tonight, and urogenital lesions. In this connexion, however, I beg leave to quote from Goldthwait's recent (October, 1933) article on "Backache".

> Pain in the back, or backache, in the first place almost always represents trouble with the structures of the spine and is rarely ever due to disturbances of the viscera. The pain may be due to strain or injury of any of the spinal structures, but since most of the cases represent joint sprain primarily, the pain will usually be referred to very definite regions—the sacro-iliac, lumbo-sacral, dorso-lumbar, etc.

In the same article the author points out that frequency of micturition, worse at night, while the patient is recumbent, may be a symptom of sacro-iliac strain, whilst the same trouble worse by day, while the patient is standing, may accompany lumbo-sacral strain.

Constipation as a cause of backache may easily be overlooked. Verral has pointed out that an overloaded colon, in addition to the backache it may produce in virtue of its weight and of the toxins it may feed into the circulation, may also cause backache from pain referred along the distribution of the two lumbar nerves.

Postural Imbalance.

I have purposely kept the chapter on postural imbalance till the last, because to me this is the underlying cause of the great majority of backaches; perhaps I had better add, of those seen by the orthopædic surgeon.

In this class one includes all those disturbances caused by the erroneous deflection of body weight causing strain on spinal muscles, ligaments and joints. There is, of course, no such thing as skeletal balance apart from muscular action. So that, in

the back, as in the foot, the problem is one of muscle imbalance, and the road to better treatment lies along the lines of restoring muscle balance. These disturbances of equilibrium may take place either from side to side or fore and aft. In the former the pelvis tilts sideways, and purely local mechanical faults are at the root of the matter. Variations in the lengths of the two legs are common and cause pelvic tilting. Congenital abnormalities of the lumbar vertebræ are common and contribute. Any one-sided leg trouble, in foot, knee or hip, can bring about this side-to-side tilt. When we consider the fore and aft imbalance, we are face to face with one of those fundamental difficulties *Homo erectus* is experiencing in maintaining his erect posture. The human skeleton is merely the quadruped skeleton in an upright position, without radical changes, and the lumbo-sacral and sacro-iliac joints which were fitted for the quadruped are under stress in the upright position. That lumbar curve, convexity forwards, is a purely human curve, maintained still at great muscular expense—the last to come and the first to give trouble under stress. In standing, if the *gluteus maximus* tires (as it does, being itself a *parvenu* amongst muscles) the pelvis tilts forward, carrying with it the lumbar spine into an increased lordosis.

In early walking this must often happen. In early childhood the pot belly of the not quite perfectly nourished child tends still further to tilt the pelvis forward, and in the pregnant woman the same dire forces are at work. It takes a very strong woman to maintain the flat back of Venus di Milo, but still it is something worth trying for.

A pair of valgoid feet, by rotating the femora inwards, contribute to pelvic forward tilting. And a pair of short *tendines Achillis*, or what is the same thing, a pair of high-heeled shoes, by throwing the body weight forward, contribute to a lumbar lordosis which has to be increased to produce adjustment.

Postural strain is often the result of occupational attitude. Let anyone who has to bend over his work habitually (thereby throwing body weight forward and increasing lumbar lordosis) try the effect of standing with one foot on a stool while at work. This relieves the strain at once. In this connexion Goldthwait's classical observation that long, slender-backed people were prone to sacro-iliac joint strain, whilst short-backed types were liable to get lumbo-sacral strain, comes to mind.

Combination of Causes.

We have been at pains to analyse as far as possible the prime causes. There remains mention of the cases which are due to a combination of causes. Take for example the congenital wedged fifth lumbar vertebra, which causes no trouble until a severe wrench occurs while the patient is mountain climbing; thereafter a bad back pain comes on. Here we have the postural error *plus* trauma. You can, I am sure, all recall cases in which a trauma to the spine has persisted and a bad tooth, a bad tonsil, or gonorrhœa has been found blameworthy for the persistence.

The preexisting spondylitis of one type or another (or spondylosis?) to which a trauma has been added, causing a prolonged disability, is familiar to all who have any dealings with workers' compensation cases. Such combinations are capable of infinite variety and call for corresponding variations in treatment.

Treatment.

When I first asked myself what I really knew about low back pain (as apart from what I thought or believed) the answer was that belts or corsets, manipulation and exercises seemed to cure most of them. Now we can ask why. And the answer is that exercises alone cure early slight postural errors, manipulation *plus* exercises are required for advanced postural errors and that belts *plus* manipulation *plus* exercises are required to cure postural errors to which trauma has added the factor of joint stress in sacro-iliac or lumbo-sacral joint.

For severe acute spondylitis, for infective arthritis, for spondylolisthesis, for Kümmell's disease, for fractures *et cetera* I use the large Thomas's posterior spinal support. For lumbo-sacral strain, lumbo-sacral congenital error, lumbar lordosis I use the low back brace. For sacro-iliac sprain the best support is a sacro-iliac belt. For a milder osteoarthritis a stout high corset is used. And for ligamentous and muscular strains, also for sacro-iliac sprain, firm strapping with "Z.O." plaster is efficient first aid treatment and may be all that is necessary.

Manipulation finds its special sphere of usefulness in mild osteoarthritic cases, especially those with reflected pain down the leg or into the lower part of the abdomen; also in muscular and ligamentous sprains which have been allowed to form adhesions owing to poor early treatment; and in sacro-iliac and lumbo-sacral sprains which have formed capsular adhesions and secondary protective muscle shortening. It also comes into play for the postural strain, where malposture (for example, hyperextension of the lumbar spine) produces sprain of interarticular joints, lumbo-sacral and sacro-iliac joints, such sprain being followed by the usual protective muscle shortening; and where malposture has persisted so long as to produce contracture of all soft tissues.

Exercises alone, the underlying object of which is to see that the body is so placed and so held that the spinal joints will naturally be held midway between full extension and full flexion, suffice for the treatment of the primary early postural cases. But the most important sphere of usefulness of exercises comes in as after-treatment following manipulation.

Conclusions.

1. Lesions of the back, both by their referred pains and by actual nerve pressure, are capable of causing pains in remote parts of the body which may lead to mistaken diagnosis.

2. Postural errors cause most painful backs, and any underlying imbalance should be sought for and treated, no matter what other more obvious cause requires treatment as well.

ROLE OF SURGERY IN CARCINOMA OF THE BUCCAL CAVITY.[1]

By H. SKIPTON STACY, M.D., Ch.M., F.R.A.C.S.,
Senior Surgeon, Sydney Hospital and Royal South Sydney Hospital.

IN this paper I would include structures from the lip to the tonsil.

Pathology.

That carcinoma of the buccal cavity is seen so much more frequently in the poor than in those more comfortably off is due in all probability to the greater frequency in them of buccal sepsis, such as pyorrhœa, carious teeth, septic tonsils *et cetera*. It is rare in women.

Leucoplakia of the tongue is in my opinion a not infrequent result of this buccal sepsis; it is not a far step from that to malignant disease.

Carcinomata in this region are always of the squamous-celled type. One gets frequent confirmation of the fact that in buccal carcinoma repeated irritation is an important factor in the ætiology; such irritants as an ill-fitting denture and sharp jagged teeth are frequently observed. Alcohol and tobacco are common in the history. The hot column of smoke drawn through the stem of a pipe or the holder of a cigarette and projected against the mucosa of the tongue, palate or tonsil is thought to be an important factor.

Syphilis has been an antecedent in a large number of cases, but too much time need not be wasted in antisyphilitic treatment. Ulceration, underlying and surrounding induration are the conspicuous features which make for the diagnosis; the ulceration is occasionally, but rarely, an inconspicuous feature.

I have seen a septic tonsil cause a persistent soreness with accompanying inflammatory signs at the back and side of the tongue. It is possible that this may be a pre-cancerous condition, which, if not treated, may develop into malignant disease.

I think that Sampson Handley[(1)] more nearly explains the origin of these conditions than any other whose work I have read. In 1929 he delivered an address in New Zealand entitled "Lymph-Stasis the Precursor of Cancer".

As he says, it does not take us far to say that chronic irritants produce cancer. We want to know whether their effect is a direct one on the epithelium or is exerted indirectly through an action upon the connective tissue. He takes the view that these various forms of irritation set up an obliterative lymphangitis in which the epithelial hypertrophy is a secondary consequence. He remarks that papillomatous hyperplasia is the recognized precursory stage for X ray cancer, also that chronic glossitis with papillary hypertrophy is the usual precursor of carcinoma of the tongue. Carcinoma of the lip, of the bladder, and of the larynx frequently arises on a preexisting papilloma. Cases of multiple papillomata of the colon are known to end almost invariably in carcinoma. There are some who maintain that nearly every case of breast cancer is preceded by papillary hypertrophy or by definite papillomata.

Pathogenesis of the Papilloma.—If a single papilloma of the skin or of the mucous membrane is examined, it is found to consist of a teat-like elevation of the connective tissue carrying in its substance a meshwork of blood capillaries. These capillaries are supplied by an arteriole and drained by a venule. The papilla is clothed by a covering of epithelium. The central structure of every papilla of the skin or the mucous membrane is a lymphatic capillary exactly like the lacteal vessel of the papilla of the small intestine. Sampson Handley believes that papillary hypertrophy occurs only when this central lymphatic vessel of the papilla is blocked. From the blood capillaries of the papilla there exudes into its connective tissue spaces a constant nutritive stream of diluted blood plasma at a certain pressure. The excess of fluid is renewed and the equilibrium is maintained by the drainage action of the central lymphatic. Block this lymphatic and what will happen? The first effect will be a rise in the pressure in the intercellular spaces of the papilla, and the papilla will increase in size until the intercellular pressure is equal to the pressure in the capillary blood vessels. A second effect will be over-nutrition and consequent proliferation of the papilla itself and of the overlying epithelium. But the most important effect of all remains to be considered. In the normal papilla a constant stream of blood fluid, along with lymphocytes, is exuding from the capillaries and passing away by the lymphatic. As soon as the lymphatic is blocked, stasis occurs and the flow of fresh blood fluid through the papilla is arrested or greatly retarded, even though just as much blood may be passing through its blood capillaries. Two consequences are inevitable: the supply of oxygen to the tissues of the papilla, to its epithelium as well as to its connective tissue, will be much reduced; furthermore, the supply of hormones to the cells of the papilla will be cut off or greatly diminished. In this connexion he used the term "hormone" somewhat loosely to signify those products of the rest of the cells of the body which are necessary to the well-being of the cells of the papilla we are considering.

Local lymphatic stasis brings about a definite rupture of the contract in virtue of which the unicellular organism originally foreswore its egotism and became a social unit in the multiple cellular organism, or, in the terms of biochemistry, the epithelial covering of the papilla is deprived of the supply of growth-inhibiting substance, which in

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

a well conducted cell community is circulated to every cell.

Local lymphatic obstruction must seriously reduce the supply of oxygen to the epithelium of the blocked papilla. It would not be surprising if in the course of years the affected epithelium, adapting itself to meet this difficulty, should acquire a type of metabolism in which oxygenation played a relatively subordinate part.

Sampson Handley in his address could present only one variety of cancer showing with absolute clearness all the stages from the initial obstruction to fully developed carcinoma, a cycle of changes occupying in the human subject from twenty to thirty years. This was in *lupus erythematosus*. He draws attention to the observations of Cherry, of Melbourne (THE MEDICAL JOURNAL OF AUSTRALIA, February 9, 1929), who ascertains statistically that, whereas during the last thirty years the death rate from tuberculosis has greatly diminished and that from cancer has greatly increased, the combined death rate from tuberculosis and cancer together has remained at the constant level. Cherry's interpretation of this was that persons who recover from an attack of tuberculosis are likely in later life, and as a consequence of their attack of tuberculosis, to die of cancer. Handley adds that every tuberculous infection is of the nature of a chronic lymphangitis and must leave behind it some degree of lymphatic obstruction. Handley differs from Cherry in denying to the tubercle bacillus any specific rôle in the production of cancer. In his opinion, any pathological process which gives rise to lymphatic obstruction may be a cause of cancer. The specific factor is not the particular organism concerned, but the lymphatic obstruction to which that organism may give rise.

Clinical observers would seem to confirm this; for example, the history of syphilis is mainly a study in the pathology of chronic lymphangitis. The primary lesion is a local proliferative lymphangitis. There follows enlargement of the regional lymph glands, and then an invasion of the lymphatic plexus with an accompanying secondary rash, often presenting papillary lesions. Lymphatic obstruction is clearly evidenced by the appearance of condylomata, mucous patches, and moist papillomata of the tongue and lips. In the tertiary stage the deeper lymphatics are invaded, and gummata which are areas of local proliferative lymphangitis make their appearance. The chronic glossitis which syphilis leaves behind it is an obstructive lymphangitis, known frequently to lead to papillary hypertrophy and carcinoma. Carcinoma of the lip and of the inside of the cheek not infrequently arises on the scar of an old mucous tubercle.

Chronic lymphangitis is not exclusively caused by the organisms of tuberculosis and syphilis. It may be due to many other organisms—for instance, to the members of the pyogenic group—and these organisms, also in so far as they may produce lymphatic obstruction, are potential cancer-producing agents. Chronic lymphangitis may also be set up by a chemical or thermal agency.

At the end of his address he pleads that, although his remarks may contain a large amount of speculation, they should be taken as a working hypothesis.

My own feeling is that in buccal carcinoma at any rate there is much to support his ideas.

In this connexion I should like to draw attention to a patient with a lesion of the tongue who has been under my care during the last few weeks. He is edentulous, so has had marked dental sepsis. His tongue shows extensive leucoplakia, several papillomata on the dorsum, and epithelioma on the left margin. His serum did not react to the Wassermann test.

I show a coloured photograph of the tongue before removal and microphotographs of sections, (*a*) through the leucoplakia, (*b*) through the papilloma, (*c*) through the epithelioma.

Dr. Keith Inglis's report is as follows:

Section Labelled Leucoplakia.—Microscopic: Shows early squamous carcinoma involving a wide area of squamous epithelium.

Section Labelled Papilloma.—Microscopic: Shows hyperplasia of squamous epithelium; the lesion is not papillomatous or carcinomatous, but shows what is probably an early stage of the epithelial overgrowth before this becomes malignant.

Section Labelled Tongue Ulcer.—Microscopic: Squamous carcinoma with deep infiltration (muscle involved).

Metastasis is practically always through the lymphatic glands. Lymph vessels from the lips end mainly in the submental and submaxillary glands; occasionally they pass directly to the superior deep cervical glands. Some of the more superficial vessels may end in the superficial cervical glands.

Lymph Vessels of the Tongue.

The lymph vessels of the tongue form three groups: (i) anterior, (ii) middle, (iii) posterior. The anterior and middle groups communicate freely with each other and with their fellows of the opposite side, but the posterior group have little or no communication with the middle group. The anterior lymph vessels drain the tip and the lower surface of the anterior free portion of the tongue; they end in the submental glands.

The middle group of lymph vessels drain the anterior two-thirds exclusive of the tip, and they terminate partly in the submaxillary, and partly in the superior deep cervical glands.

The posterior lymph vessels drain the portion of the tongue which lies posterior to the circumvallate papillæ; they pass to the superior deep cervical glands.

It is essential to remember that lymphatic vessels cross the middle line of the tongue and drain into cervical glands on the opposite side to the malignant growth.

Lymph vessels of the tonsil and adjacent area end in a gland or group of glands which lie on the internal jugular vein immediately below the posterior belly of the digastric, often known as the jugulo-digastric gland; the deep cervical glands above and below this may also be involved.

Lymph Vessels of the Cheek.

The majority of the superficial and deep lymph vessels of the cheeks pass to the submaxillary glands, but in some cases they communicate directly with the superior deep cervical glands.

Treatment.

General Treatment.

There are certain remarks on the various phases treatment has gone through during the last twenty years or so which are equally applicable to lip, tongue, floor of the mouth, and tonsil.

It is the experience of surgery (as of human life in general) to witness over-enthusiasm for new treatment to be met with a counterblast of criticism in which the excessive claims of pioneers are countered with stories of failure and harmful results. That large body of the profession, looking on at the battle with a certain degree of cynicism and amusement, in most cases profits from the mistakes of both parties and takes the middle course.

This applies to the surgery of the buccal cavity, as it does to the modern methods of treatment by radiation in that area which, in the hope of some, were going to displace it. The truth, as ever, is in the mean.

If treatment by radiation has been disappointing in some cases, so too has surgery. The results of radiation treatment (I speak mainly of radium, of which I have had most personal experience) are sufficiently wonderful in many cases to justify the hope that, with improved knowledge of dosage, screenage and technical methods of application, the results will keep on improving.

I feel sure that when surgeons criticize radium they do not discriminate between the older and newer methods of application. The use of radium was for so long restricted to plaques that many of our profession are unaware of the vastly superior results obtained by interstitial application, such as needling.

The Lip.

Radium applied in the form of needles is a serious rival to surgery in places such as the lip, but if the lesion were a small one, I should still advocate surgical excision as the quickest method. The patient by it is well in two weeks, with very little deformity, or one that soon passes away. In a more extensive lesion radium is preferable, since if the dose is adequate, cure is just as probable, and it has the added advantage of a much better cosmetic result. Before the days of radium needling, when I excised these extensive lesions, I made a new lip with the aid of a tube graft from the neck; this makes an excellent substitute even to the vermilion tinge of the border (the passive congestion resulting during the time that the tube graft is acquiring its new circulation from its upper and lower pedicles accounts for this reddish tinge). I have used radium in doses of 800 to 1,600 milligramme-hours, according to the extent of the lesion. Where recurrence has taken place I have had reason to believe that that particular region has not been sufficiently irradiated. I had one case of radium necrosis of the alveolar border of the mandible (the dose given was 2,087 milligramme-hours). I attribute this largely to the unusually atrophic mucosa covering it; perhaps in part to the size of the dose. Although twelve months have elapsed, the necrosed bone has only just separated.

In all cases I have followed the use of radium several weeks later with excision of the glands of the digastric triangle (on both sides if the lesion is centrally situated, on the one side if the primary lesion is definitely unilateral). Care must be taken to remove the submental glands, which might be missed in the fatty tissue of that region. If the glands of the digastric triangle are adherent to the mandible, then a small portion of bone would need to be taken away with the mass *en bloc*. For preference I surgically excise glands, where possible, rather than irradiate. There are cases, however, in which the glands are surgically inoperable; these I have heavily irradiated. For a large mass of submaxillary and deep cervical glands some months ago I used a dose of over 7,000 milligramme-hours; two circles of needles were used *en échelon*. It had a magical effect, causing most of the mass to disappear; there are still some deep cervical glands palpable below the area irradiated, causing one to wonder whether, if the dose had been bigger and the area irradiated larger, the cure might not have been complete.

A recent authority states that glands secondary to lip cancer are more radio-sensitive than those secondary to tongue and cheek (intrabuccal). I have had several cases seeming to confirm this.

Although I remove the glands in all cases, it is particularly those in which the mucous membrane is involved that glandular invasion is apt to occur.

The Tongue and Floor of the Mouth.

I have used both radium and radon for the tongue and floor of the mouth, but owing to the difficulty in restricting the action of the β rays to the soft tissues and preventing some necrosis of the mandible, I have latterly preferred to use diathermy. In one case in which radon has apparently cured the tongue lesion the patient is still troubled with an annoying burning pain in the mouth and slight necrosis of the mandible. Perhaps this is a matter of insufficient screenage, but I am quoting results just as they have occurred. Ten one-millicurie seeds were used with a screenage of 0·3 millimetre of platinum; the dose given was 54 millicuries destroyed. The screenage, I understand, is below that used in Melbourne, where radon is said to be used much more frequently than in Sydney and with more success. I understand that this matter of screenage of our radon is shortly to be attended to by the Commonwealth physicist (Mr. Turner). As to the radium needles, I understand that a variation in the stereotyped straight kind is to be

introduced; if so, this should overcome some of the difficulties of correct application and keeping in position.

In a recent case of carcinoma of the dorsum of the tongue I applied radium needles under narco-local anæsthesia, thinking this would be safer than diathermy with a general anæsthetic in a patient who was a very bad surgical risk (he had syphilitic aortitis, aortic regurgitation, and an aortic aneurysm). He was given a dose of 1,600 milligramme-hours. The local reaction was very good; the needles were removed in seven days. The patient's temperature rose early; he gradually sank; autopsy revealed septic bronchopneumonia.

Presumably the reactionary swelling of the tongue interfered with his swallowing reflex, thus infective secretions got down the larynx to the lung. Thus surgery and general anæsthesia are not alone in exposure to the risks of septic bronchopneumonia.

But surgery by scalpel or scissors still has its scope in those early cases in which the tongue is freely movable, and one can excise the growth without any risk of cutting through invaded tissue. The cut surfaces of the tongue can be brought together and healing be obtained more quickly than after diathermy.

It is also a useful procedure sometimes to divide branches of the fifth nerve (for example, the inferior dental) for the relief of pain.

In this respect I feel that surgery of access, as it is called, is going to be of immense help to radiation treatment; approaching the base of the tongue through the hyoid region (even to the extent of dividing the hyoid bone if necessary) will aid the more accurate placing of radium needles or radon seeds.

I feel that this combination of surgery and radiation may render some of the so-called radio-insensitive growths radio-sensitive.

Diathermy.

In discussing these cases one must not forget that quite a number of patients come with a lesion that is frankly incurable, yet they wish relief from pain perhaps, or from the unpleasant odour from their mouth, which renders them almost repulsive to those in their vicinity; also they wish for life to be prolonged, strange as it may seem. What treatment offers the best prospect? I think a powerful diathermy knife with cutting and coagulating current. In many cases all cannot be removed, but in some an apparent cure may be obtained, in others a marked degree of relief. I have operated with apparent success in patients up to the age of eighty-three years.

With an efficient apparatus (the one I use has a voltage of about 1,000 and a frequency of 1,500,000 to 2,000,000 per second) the operation need not be a long one, so that ether has been given in nearly all my cases, administration ceasing a minute before I begin. If the mandible is divided through the symphysis in order to give proper access, then the ether can be administered intranasally until this portion of the operation is finished.

It is quite likely that I have allowed my bias in favour of ether as against chloroform to carry me too far; I am now in favour of giving chloroform administered by the Juncker inhaler during the course of the operation in those cases in which the procedure is of any great extent; otherwise one finds that the patient commences to come out in the later stages. Struggling or movement will add to the difficulties of the surgeon.

Just recently I have been giving "Amytal", 0·36 gramme (six grains), and atropine, 0·65 milligramme (one one-hundredth of a grain), one hour before the operation. I think this is safer than "Avertin". Ether is administered intranasally; less is needed than without premedication; it can be withdrawn while the diathermy knife is being used. This method gives a longer margin during which the patient remains under the influence of the anæsthetic, and has proved quite satisfactory. It should prove safer than chloroform.

In removing the portion of the tongue or floor of the mouth one cuts and coagulates alternately; vessels may be seized with artery forceps and the coagulating electrode applied direct to them, or it may be applied to the vessel direct, or even sparked on to it.

The after-treatment consists in irrigating the mouth with hot boracic lotion every ten minutes from an irrigator under which there is a spirit lamp. The patient practises this before the operation. Latterly, in place of the frequent boracic irrigation, I have been using the acetone-alcoholic gentian solution of Bohlman; this is said to be of special value in the mouth, keeping the tissues dry and reducing bacterial growth.

The formula is:

Gentian violet ..	2 grammes
Alcohol 95%	55 cubic centimetres
Acetone	10 cubic centimetres
Distilled water ..	35 cubic centimetres

It is applied twice daily until the slough has disappeared. I have found it very satisfactory and a great saving of labour.

In spite of every precaution, septic bronchopneumonia may supervene during convalescence. It often comes insidiously, perhaps without rise in temperature or noticeable elevation of the pulse rate. The end may come comparatively suddenly. Because of this suddenness (twelve hours or so) it may seem as if coronary thrombosis or other cardiac affection is the cause; it may, of course, be a contributing factor, as one would expect from the age of the patient, but autopsy would reveal the real cause.

Secondary hæmorrhage is rare in spite of the large vessels met with (this is ascribed to the fact that clotting takes place for some distance in the vessels). I once had to tie the external carotid on the fifth day. In spite of the foul-looking mouth that the patients have for a week or so, their temperature is rarely raised, probably indicating that the avenues of absorption are sealed; if this is so, then probably metastases are for the same

reason less likely to occur. After several weeks the wound is healed, the offensive odour has gone, together with the pain as a rule. The scar is soft and pliable. Recurrence may take place later if growth is left behind, but owing to the fibrosis which results, this is slower than if unoperated upon. A discharging sinus may continue for a time owing to osteomyelitis of the mandible in those cases in which the jaw has been divided and subsequently wired, but this is only a temporary matter.

If for some reason or other the diathermy apparatus should not function towards the end of the operation, with a wound that is bleeding, then you are placed in an awkward predicament. I met with this once and do not desire a repetition. I fancy the cause was in the indifferent electrode. I now use an improved one.

Of course, in all cases the patient is in the hanging-head position and an intelligent assistant controls the sucker (of which the water is more satisfactory than the electric); these are both important.

The glands are removed later; these may be the glands in both digastric triangles and the deep cervical which are just posterior to and overlie the internal jugular vein. These latter are best removed *en masse* with the sterno-mastoid muscle from the level of the posterior belly of the omo-hyoid muscle up to its insertion. This also may need to be done on both sides.

It is curious how seldom enlarged glands are found below the level of the omo-hyoid, although in one recent case X rays revealed mediastinal enlargement. If the glands are inoperable and fixed to the deep structures, then radium in large doses may be applied to them. I have known even breaking down malignant glands to respond (at least temporarily) to radiation.

I prefer the glands to be removed subsequently to the tongue; they are there to intercept any wandering cells that may have been displaced from the primary lesion.

Involvement of Bone.—Electro-surgery offers a means of avoidance of disfigurement by conserving some of the mandible where ordinary surgery would sacrifice the whole thickness of it. This may be effected either by dehydrating the affected portion of the bone and waiting for it to separate as a sequestrum, or by removing it at once by means of the electric *rongeur*. I have not had an opportunity of using this latter instrument.

The Tonsil.

The remarks on diathermy and surgical removal of glands apply also to the tonsil. Removal of the growth and control of hæmorrhage are undoubtedly simpler with the diathermy knife.

Surgery by the Older Methods of Extensive Dissection by Knife or Scissors.

In surgery by the older methods the lesion in the buccal cavity was generally removed *en masse* with the glands of the neck, so that no intervening, possibly-invaded tissue was left behind. In extensive cases often portion of the mandible was removed with the mass.

The advantages of this treatment are that the wide removal made recurrence less likely. There are patients alive today who probably would not be by less radical measures. As in radical amputation for breast and glands, the lymphatic vessels between the primary lesion and the glandular supply are not cut across. This used to be taught as essential in both conditions.

The disadvantages are: (*a*) The shock of the operation is considerable and not infrequently fatal. (*b*) Although at the end of the operation the buccal cavity is shut off from the neck wound, this is frequently inefficient and the latter becomes infected, with all the risks of secondary hæmorrhage. (*c*) Mutilation is greater. (*d*) Extensive removal of the tongue may interfere with the swallowing reflex after the operation and thus allow septic buccal secretions to pass the glottis into the larynx and lungs, setting up bronchopneumonia which is invariably fatal. Of course, the same might be said of very extensive removal by diathermy; but in the latter one is always enabled to leave more tissue than in scalpel or scissors removal. The risks of a similar occurrence during the operation are always present unless: (i) the anæsthesia is light, (ii) the sucker is working perfectly, and (iii) the patient is in the hanging-head position. Much safer than this is the packing of the oro-pharynx with sponges, after a preliminary laryngotomy. This procedure was introduced at Sydney Hospital in 1903 after I had demonstrated the frequency of septic bronchopneumonia in these cases in the autopsy room.

The rapidity of the diathermy operation enables the three measures referred to just previously to be sufficient without laryngotomy and packing.

Summary.

1. In the pathology of the disease attention is drawn to Sampson Handley's view of lymph stasis as a possible cause of carcinoma.

2. Such causes of lymph stasis as syphilis, sepsis and trauma (for example, ill-fitting dentures, jagged teeth and hot tobacco smoke) are seen in great frequency in the buccal cavity. It would seem as if a combination of two of these causes is sufficient in many cases to cause carcinoma.

3. The treatment recommended is the use (*a*) in some cases of surgery, by scalpel or scissors, (*b*) in others, surgery by diathermy (electro-coagulating knife), (*c*) in others, radium.

4. For the lymphatic glands surgical excision is preferred.

5. It may well be that in the future we shall see a reduction in the incidence of buccal carcinoma with the improved treatment of syphilis and the greater attention to dental hygiene that has been a feature of recent years.

6. Of deep X ray therapy I have not spoken, since the number of cases I have seen treated does not entitle me to do so.

Reference.

(1) Sampson Handley: "Lymph-Stasis the Precursor of Cancer", *The British Medical Journal*, October 5, 1929, page 607.

CANCER OF THE LIP.[1]

By L. M. McKILLOP, M.B., Ch.M. (Sydney), F.R.C.S. (Edinburgh), F.R.A.C.S., F.A.C.S.,

Honorary Surgeon to In-Patients, Mater Misericordiæ Public Hospital, Brisbane; Chairman, Treatment Committee, Queensland Cancer Trust.

IN Australia cancer of the lip is an extremely common form of malignant disease. The combined statement issued to this conference by Dr. M. J. Holmes shows that the total number of cases of lip cancer treated at the treatment centres—twenty in number—which furnished statistics to the Federal Health Department reached the total of 1,399 for the five-year period 1928-1933. This does not take into consideration, of course, the large number of patients with lip cancer who received private or ordinary public hospital treatment during the same time interval. Again, the mortality figures for the Commonwealth for the same five-year period show that 381 persons (of whom 20 were females) died from this form of cancer. Again, in the twenty-year interval 1913-1932 no less than 1,056 persons (of whom 64 were females) died of the disease.

Cancer of the lip is most commonly met with in the mid-latter period of life and in men more frequently than in women in the proportion of 95 to 5. In a series of patients operated upon at the Mater Misericordiæ Hospital in Brisbane the average age at operation was 55·5 years. The youngest patient I have known had an extensive condition involving glands of the neck at fifteen and a half years of age. This patient, operated on by me eleven years ago, remains well today. The oldest patient to come under my notice was aged eighty-nine years. It will be extremely difficult to estimate from mortality figures exactly how many deaths should be attributable to cancer of the lip, where the cause of death is stated as "glands of the neck" unless the certificates definitely include the lip as the primary focus when such has been the case. Cancer of the lip is undoubtedly the commonest cause of secondary malignant disease in the glands of the neck, and it is from the latter and not from the lip condition that the patient dies. It is the object of this short paper to emphasize this point and to indicate the types of the disease, its differential diagnosis and the best forms of treatment. I intend to deal rather with the purely surgical aspects of the disease, leaving my *confrère*, Dr. Val McDowall, who is radium specialist to the Brisbane Hospital Cancer Clinic, to make some observations upon the radiation treatment of the disease.

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

Causation.

Cancer of the lip is almost entirely confined to the lower lip and has its birth in changes which begin in the zone of transition between the buccal mucosa and the cutaneous epithelium. In this respect it is no exception, as many cancers of the alimentary tract begin at a point where the type of epithelium changes. Instances of this are seen in the tongue, gullet, pylorus and colon. Anatomically the lower lip is more exposed to injury than the upper. Such injury may be:

(i) *Mechanical*, as seen in pipe stem pressure or tooth irritation.

(ii) *Radio-Active*, as in sunburn, especially in light complexioned persons (who are more prone to the disease than are dark complexioned persons).

(iii) *Infective*, as seen in warty conditions and simple chapping of the lip. Whatever be the remote cause, the immediate antecedent cause is almost certainly a septic condition of the mouth and teeth. The commonest precursory change in cancer of the lip is leucoplakia—a condition in which the epithelium becomes hyperplastic and white. If this change, or the condition which is responsible for its appearance, particularly syphilis, is allowed to persist in the presence of a foul condition of the teeth and gums, the hyperplasia sooner or later involves the zone of epithelial transition. Continuing irritation of the newly produced successive generations of the transitional cells results eventually in the elaboration of the neoplasm. I think it can be fairly assumed that this is the mechanism by which the neoplasm takes origin.

Clinical Types.

There are four recognizable types:

(*a*) *The Ulcerative Type.*—In the ulcerative type a small indurated ulcer appears in the leucoplakic patch on the red line, the surface breaks down and the base becomes thickened. Its range of spread is laterally along the lip and forward and downwards over the cutaneous aspect. The mucosa is relatively little involved. The surface of the ulcer is irregular, tends to scab over and bleeds easily.

(*b*) *The Fungating Type.*—In the fungating type the growth early assumes the characteristics of a wart of irregular form and which may grow exuberantly for a time. However, the base quickly becomes indurated and the submental and submaxillary glands soon become involved.

(*c*) *The Fissured Type.*—In the fissured type the neoplasm takes its origin in a crack of the lip, such as might be caused by chapping or trauma. The edges of the fissure become slightly thickened and heaped up, making the crack appear all the deeper. Bleeding is easily caused and this form is the most painful. If the use of an emollient ointment *plus* surgical cleanliness does not result in any improvement or tendency to healing in two to three weeks in what has looked like a simple fissure, the condition should be regarded as suspicious enough to justify a biopsy.

(*d*) *The Herpetic Type.*—The herpetic type is a rare form of lip cancer. I can in twenty-five years' experience recall only three cases, one involving the upper lip in a male, the second also in a male and involving the angle of the mouth, and the third about the centre of the lower lip in a female. In each instance the malignancy caused early infection of the glands. Suspicion therefore should be aroused if and when a condition resembling a herpes does not behave normally.

Diagnosis.

It can be laid down as an axiom that any warty outgrowth, fissure, or ulcer which, under the influence of rest, surgical cleanliness and the use of a simple ointment, does not begin definitely to heal in three weeks, should be regarded as malignant. In case of doubt, especially if leucoplakic patches are within the mouth as well as on the lip, a Wassermann blood test should be carried out to exclude syphilis. There are, however, several conditions which may cause confusion in diagnosis:

(*a*) *Herpes.*—Common on the upper lip, herpes is acute in outset, painful, and soon shows vesiculation. The associated lymph glands are tender. Doubt need only arise if and when the apparent herpetic condition does not begin to heal.

(*b*) *Chancre.*—Chancre is commoner in females and usually involves the upper lip. The shallow, unhealthy-looking ulcer discharges a little sero-pus. As in epithelioma, the skin is more involved than the mucosa, but the glandular involvement is very early and out of all proportion to the age and extent of the primary condition. The finding of spirochætes in scrapings from the ulcer base, or of a positive Wassermann reaction, will clinch the diagnosis.

(*c*) *Simple Fissure.*—Simple fissure is usually a winter lesion, associated with chapping and lack of proper drying. It is painful, bleeds easily, but heals readily under the influence of an ointment like lanoline.

(*d*) *Simple Wart.*—Simple wart usually occurs near the angle, is not characterized by infiltration of the base or ulceration of the surface, nor are the lymph glands, in the absence of infection, involved.

(*e*) *Blastomycosis.*—Occasionally an indolent superficial sore appears on the lower lip of a middle-aged or elderly man. The surface usually has several openings from which exudes in scanty quantities a greyish thick pus. It is a chronic, painless condition and is occasionally mistaken for epidermoid cancer. Examination of the pus may show the blastomycotic fungus. I have encountered this condition on several occasions, and it can be a real difficulty in diagnosis.

Course of the Disease.

Whatever the original types, the condition, which is almost always of the epidermoid variety and seldom a rodent ulcer, is a progressive one, and sooner or later the submental and/or the submaxillary lymph glands become infected, at first in the form of reticulo-endotheliosis from the associated mixed infection, and later by metastatic cancer cells. A solitary gland lying on the ramus of the mandible, at the front edge of the masseter muscle, is frequently the earliest to become infected. Once metastasis to the cervical nodes has occurred, cancer of the lip quickly becomes a much more serious matter for the patient. If the primary growth itself or the mandibular or upper submaxillary lymph gland becomes adherent to and by contact spread infects the mandibular periosteum, the prognosis becomes infinitely more grave, and Bloodgood has gone so far as to state that every such case is hopeless. With this view I certainly cannot agree. Once the cervical nodes are well infected, the danger zone now shifts from the lip itself to the carotid sheath group. Sepsis from the ulcerating neoplasm also enters the same glands and doubtless stimulates the malignant deposits to accelerated growth, besides inflicting toxæmic damage upon the patient's general condition. In this way mixed infection gravely injures the cancer patient, just as it does in tuberculosis. Very soon the deep cervical glands become fixed to and invade the carotid sheath and the common facial or internal jugular veins, causing generalized dissemination, or they may spread the infection downwards into the posterior mediastinum. Pain, toxæmia and possibly hæmorrhage soon terminate the patient's life. The lesson we have to learn from all this is that in cancer of the lip, as in many other situations in the body, it is not the primary focus, but the secondary gland involvement, which causes the fatal issue.

Treatment.

Preventive Treatment.

Cancer of the lip is largely a quite preventible condition. When one reflects that the lower lip is one of the most exposed sites of the body, liable to trauma from sunburn, injury from pipe stems, utensils used in eating and drinking *et cetera*, and that these influences, when they do eventuate in cancer, first set up an easily recognizable condition of leucoplakia, simple ulceration or some other precancerous change which is obvious not only to the patient, but to his friends, one naturally wonders why it is that the disease is allowed in so many cases to reach such an advanced stage before proper advice is sought. There can be only one rational explanation, and that is the lack of public education in essential cancer knowledge. Every middle-aged or elderly man should know that any ulcer, fissure or wart on the lip is a potential cancer and that if such a condition does not quickly begin to heal with simple treatment, he should get expert advice. Cancer of the lip is rarely seen in a person with a surgically clean mouth, and neglect of oral hygiene is, in my opinion, the chief predisposing cause of cancer of the lip, tongue, floor of the mouth and upper part of the alimentary canal.

Curative Treatment.

1. In the earliest stages of the disease, in which the malignancy is confined to the lip, local excision by the parallel strip method (but not by the old-fashioned "V" method) should be carried out. The excised tissue should be sent for biopsy, and if the report shows Grade I of epidermoid cancer (Broder's classification), the patient should be told to report every two to three months for a while. The prognosis should be good. In the alternative, radium needles may be buried in the lip around the growth for a predetermined period, such as six to eight unit strength needles, with 0·8 millimetre of platinum filter for seven days. The results as shown in the combined statement and in the figures from the Brisbane Hospital and Mater Misericordiæ Hospital are usually good. One cannot, however, refrain from the thought that pure radium treatment may only lock up, as it were, some of the cancer cells in the depths of the growth so that they may yet again assert themselves. In point of fact, I have purposely excised five lips which appeared to be clinically cured by interstitial radium, and have found definite isolated cancer cells in two of the specimens. I only mention this experience for the purpose of recording it and not with any idea of condemning the principle of radium treatment.

If, however, the metaplasia is of Group II or III, the submental, submaxillary, mandibular and upper deep cervical glands should be thoroughly dissected out on both sides of the neck if the neoplasm is close to or in the mid-line of the lip. This should be done even if the glands are not palpable. I do not favour diathermy for early cancer of the lip, but this method of removal has advantages in advanced cases in which most of the lip has been destroyed by the disease.

2. When the primary lip growth is more advanced and glands are palpable, the safest procedure to adopt is thoroughly to open up both lateral neck triangles after infiltrating with 0·5% "Adrocaine" solution. The gland mass should be removed from below upwards by block dissection. When this has been done, the whole wound is then covered by hot, moist packs, and a considerable portion of the lip, well wide of the growth edges, is excised between parallel vertical incisions. The lip defect is then closed and then the cervical wound is dealt with after providing for drainage. Six weeks after the wound has healed, a radium pack or collar should be applied to each side of the neck, or suitable X ray dosage should be given through a copper filter.

3. When the primary growth is very advanced and large fixed masses of glands can be felt in the neck, the foul growth in the lip should be excised with the diathermy knife, and heavy dosage radium packs should be applied each day for some hours to each side of the neck. These measures, while in no sense aiming at curing the patient, will greatly diminish his pain and toxæmia, increase his comfort and prolong his life, especially if assisted by opiates and bromides.

The Question of Surgery versus Radiation in Cancer of the Lip and Glands of the Neck.

As one who is primarily a surgeon, I must confess a bias towards radical surgery in cancer of the lip. I readily admit that some cases of cancer of the lip, usually early cases, treated by radium alone, have been brilliant successes, but I know of many which have ultimately been dismal failures and that because of the failure to deal adequately with the neck glands. "What does it profit a patient to save his lip and lose his life later from cancer of his cervical glands".

I do, however, hold that when X ray tubes can be built to give an output of short wave radiation akin to that given off by a radium "bomb", much better clinical results will ensue in the radiation treatment of glands of the neck.

Results of Treatment.

In so far as the Queensland Cancer Trust's main treatment centre in Brisbane is concerned, 52 patients received treatment for lip cancer in the period under review (1929-1933). Of these, 22 were treated by surgery alone; of them, 13 had palpable glands and 9 did not. Of the 13 with glands, 6 are alive and well, 6 are known to be dead, and 1 cannot be traced. Of the 9 without palpable glands, 7 are known to be alive and well, and 2 cannot be traced.

Of the 30 patients treated by radium only, 11 are alive and free of symptoms up to four and a half years.

We have come to the conclusion that buried radium is far superior to surface treatment in cancer of the lip.

Five patients in an advanced condition were treated by radium followed by X rays and surgery. Of these, two remain alive and well over two years after treatment, but are, of course, still under observation. The results are set out in the accompanying tables.

MATER MISERICORDIÆ HOSPITAL CLINIC (QUEENSLAND CANCER TRUST).
Showing Cases in which Radium Treatment was used during the five year period 1929–1933.

26 patients treated with radium alone (interstitial).	9 Operable.	3 alive and free from symptoms.	
		3 local improvements.	
		1 local improvement and recurrence.	
		2 No information.	
	14 Borderline.	8 Alive and free from symptoms.	
		2 Local improvement and recurrence.	
		1 Local improvement — died of other causes.	
		3 No information.	
	2 Inoperable.	1 Local improvement — died other causes.	
		1 No information.	
	1 Very advanced.	Local improvement — died of metastases.	
2 patients treated with radium mould.	1 Inoperable.	Local improvement — died of other causes.	
	1 Very advanced.	Local improvement.	
2 patients treated with radium plates.	2 Operable.	1 Local improvement.	
		1 No information.	

Total: 30 cases treated by radium only.

MATER MISERICORDIÆ HOSPITAL CLINIC (QUEENSLAND CANCER TRUST).
Showing Cases in which Radium Treatment was used during the five year period 1929–1933.

4 patients treated by radium *plus* X rays.	1 Operable.	Local improvement.
	1 Borderline.	Alive and free from symptoms.
	2 Very advanced.	1 Local improvement, died of metastases. 1 Not improved—died.
1 patient treated by radium *plus* diathermy.		Local improvement, died of other causes.
6 patients treated by radium *plus* surgery.	1 Operable.	Alive and free from symptoms.
	2 Borderline.	1 Alive and free from symptoms. 1 Local improvement.
	3 Very advanced.	1 Alive and free from symptoms. 1 Local improvement and recurrence. 1 Local improvement — died of other causes.
1 patient treated by radium *plus* carbon dioxide snow.	Borderline case.	Alive and free from symptoms.
5 patients treated by radium *plus* X rays and surgery.	5 Very advanced.	2 Alive and free from symptoms. 2 Not improved—died. 1 No trace.

MATER MISERICORDIÆ PUBLIC HOSPITAL.
Showing Cases of Cancer of Lip in which Surgical Treatment was used from January 1, 1929, to June 30, 1933.

Sex.	Age.	Glands.[1]	Results.
Male.	69	+	Relieved.
Male.	39	+	Cured.
Male.	75	−	Cured.
Male.	45	−	Improved.
Male.	61	−	Relieved.
Male.	72	+	Relieved.
Male.	52	−	Relieved.
Male.	73	+	Fair.
Male.	69	+	Improved.
Male.	30	+	Left at own request.
Male.	49	+	Fair.
Male.	47	+	Cured.
Female.	39	−	Relieved.
Male.	75	−	Improved.
Male.	40	+	Cured.
Male.	42	−	Cured.
Male.	46	−	Cured.
Male.	59	+	Relieved.
Male.	42	−	Relieved.
Male.	64	+	Cured.
Male.	60	+	Cured.
Male.	70	+	Cured.

[1] + = Glands palpable. − = No glands palpable.

Acknowledgement.

I should like to express again my appreciation of the assistance afforded me by the Registrar-General of Queensland (Mr. George Porter) in providing what statistical information I required for the purpose of this short paper.

EPITHELIOMA OF THE LIP: ANALYSIS OF CASES.[1]

By ERIC M. FISHER, M.B., Ch.M.,
Honorary Assistant Surgeon, Royal Prince Alfred Hospital, Sydney.

EPITHELIOMA of the lip is found clinically in one of two types, hypertrophic or infiltrating. It may occur at any site in the upper or lower lip or at the angles of the mouth. It usually begins at or close to the junction of the skin and vermilion border of the lip, and quite often more than one area of the lip is affected separately. It may take many different forms, some of which are quite atypical and may not at first sight suggest cancer. Especially is this the case when the tumour reaches a comparatively large size without ulceration. It may be impossible to make a definite diagnosis without biopsy.

The duration of the tumour may be long or short. Sometimes it may have been present for many years with more than one disappearance as a result of treatment by radium, X rays, diathermy or excision. As a rule the duration is a year or more, but some examples, particularly the hypertrophic type, may reach a large size in a few months or even weeks. When they spread to the mucous membrane of the lip or cheek they may grow rapidly and invade the tissues of the cheek or the mandible about the middle line, with the result that they may become incurable by any form of treatment.

At the radium clinic at the Royal Prince Alfred Hospital, from November, 1928, to December 31, 1933, there have been 358 cases; of these 10 have been considered hopeless and have been given no treatment. There were 25 females among the 358 patients, which is 7%, a rather high figure. We have a feeling that it is becoming more common in younger subjects; there were 26 cases in patients under thirty years of age, the age of the youngest male being seventeen years and of the youngest female twenty-five years. The upper lip was the site of the disease in three instances.

In the great majority of cases the growth is a typical squamous epithelioma with cell nests. Sometimes cell nests are absent, but the very malignant undifferentiated anaplastic type found in growths of the tongue and tonsil is rare in the lip.

Little help in treatment or prognosis is gained from histological grading; by that I mean that any one type is just as likely as any other type to recur, invade glands or prove radio-resistant.

They are almost all radio-sensitive, but occasionally one is found in which radium in presumably adequate doses is without effect. There were 219 patients treated with buried radium needles; of these eight showed no local improvement. The primary lesion has been treated mainly by means of buried radium needles containing 1·5, 2·0 or 3·0 milligrammes, usually left in position for seven days and occasionally for ten days. There were 219 cases, as mentioned above.

In 56 cases the lesion was excised surgically. Many of these have been early and small and were excised *in toto* for diagnosis.

Twenty-four patients have been treated with X rays; two have been treated by diathermy; 57 were not treated, 10 being considered hopeless, and 47 did not report for treatment.

There were 12 cases of recurrence in the lip after treatment.

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

In the majority of patients the cervical glands are uninvolved, and if the primary growth is cured will remain permanently uninvolved. There is no doubt about this, and as a direct consequence it has been recommended that the glands should be excised only when obviously invaded with cancer; otherwise the patient should be kept under close observation after treatment of the primary growth and that the glands should be removed if and when they become involved.

The solution is not so simple as this, and we have been impressed by the difficulty of decision. There is no way of forecasting which patient will develop secondary glands; whatever the pathological type of growth, it is just as likely or unlikely. In young patients there is no doubt that the disease is often very malignant. Are we to leave the glands behind in these patients? We have seen, even in a patient reporting at regular monthly intervals, a gland appear and become adherent to the mandible between visits.

Some patients, no matter how it is impressed on them, will not report regularly when nothing abnormal is evident in the neck, and even if a lump is found, do not come at once. This has been frequently observed at the clinic. More than one patient has not reported till an inoperable mass of large fixed and adherent glands about the angle of the jaw is present.

Sometimes glands are enlarged and palpable, and on removal no cancerous involvement is found in them. This seems prone to occur with primary growths which are infected, such as large fungating epitheliomata.

It is certainly going too far to advise excision of glands in all cases as a routine measure; but in our opinion the difficulty is to decide when not to excise, rather than when to excise them. We believe excision should be carried out under the following conditions.

1. In all cases with a long history, especially where there has been much treatment.
2. In all large epitheliomata.
3. When any lymphatic glands are palpable, even when soft.
4. In very young patients.
5. When the growth has invaded the mucosa of the mouth.
6. In all growths at the angles of the mouth.
7. When the lip is deeply infiltrated.

If excision is decided on, the glands of the submental and both submaxillary triangles should be removed. It is not sufficient to operate on one side only. We have had several examples in which a gland or glands in the untouched submaxillary triangle had become involved.

In all cases the carotid pocket below the digastric muscle should be palpated and any enlarged glands removed. The glands are excised and radium is embedded in the lip at the one operation. We are convinced that operation on the glands in no way interferes with the radium reaction, and further, some patients, if allowed to go out after treatment of the lip, will not return for operation on the glands.

Of the 358 patients, 79 had clinically enlarged glands. In 90 cases the glands were excised, 21 of which proved to be invaded by cancer. In 8 cases in which the lip only was treated the glands later became invaded. In 13 cases there was a recurrence in the neck after excision of glands.

EPITHELIOMA OF THE LIP AND ASSOCIATED GLANDS.[1]

By I. B. JOSE, M.B., M.S. (Adelaide), F.R.C.S. (England and Edinburgh), F.R.A.C.S.,
Honorary Surgeon, The Adelaide Hospital, Adelaide,

AND

H. A. McCOY, M.B., Ch.M. (Sydney), D.M.R.E. (Cambridge),
Honorary Radium Therapist, The Adelaide Hospital, Adelaide.

DURING the past four years an attempt has been made at the Adelaide Hospital to standardize the treatment of epithelioma of the lip and associated glands according to the following variable factors: (i) age of patient, (ii) the extent of the primary lesion, (iii) the extent of metastases in the cervical lymph glands, (iv) the existence of concurrent diseases.

Preliminary Investigation.

Toilet of the mouth has become an important factor in preparation for treatment, and it has become apparent that neglect of this in some of the earlier cases was probably responsible for delayed healing of the primary lesion. Septic teeth are treated or extracted before the treatment of the epithelioma is commenced.

A biopsy is made in every case, usually at the time of the primary treatment, and the result is known within two days.

A Wassermann test is made in doubtful cases or in the presence of syphilis.

Treatment of the Primary Lesion.

The routine treatment has been to bury radium needles into the substance of the lip and chin, and the dose administered has been 1·5 millicuries destroyed per cubic centimetre of tissue treated.

The needles employed are the unit strength needles, screened with 0·5 millimetre of platinum, issued by the Commonwealth Government, and for lesions not larger than 1·0 centimetre in diameter the needles are distributed as follows: (*a*) Two two-milligramme needles are embedded parallel in the lip substance at a distance of one centimetre, one in the mucous aspect and one below the muco-

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

cutaneous margin. (*b*) Two one-milligramme needles are embedded *en barrage* in the tissues of the chin.

The block of tissue irradiated is thus roughly triangular in shape, and the lesion occupies the centre of the base of the triangle. When the lesion is larger, the block of tissue treated is correspondingly larger, and longer needles are inserted, particularly in the base of the triangle.

Departure from this routine has been made only in cases of recurrence after previous treatment, either surgical or radiological. In such circumstances the recommendation for treatment of the lesion is influenced by the amount of scar of previous treatment and the possible indication of radio-resistance, as judged by the result of previous radium treatment. Combined surgical treatment and surface irradiation have been recommended in such cases.

The presence of concurrent diseases has not altered the recommendation of treatment of the primary lesion, although we believe from the experience of the last four years that the existence of mouth infection and syphilis calls for active and effective treatment before the radium treatment is undertaken.

The recommendation of this treatment of the primary lesion has not been varied on account of age of the patient or of the existence of metastases.

Treatment of Associated Lymph Glands.

In all cases of proven epithelioma of the lower lip the glands are treated by surgical dissection of the submaxillary regions from three to six weeks after the radium treatment of the primary lesion, except under the following conditions: (i) When the patient is more than sixty years of age or when the general physical condition would not warrant such a surgical operation. (ii) In the presence of any concurrent disease which contraindicates surgical operation. (iii) When the glands are involved and fixed and inoperable. (iv) In selected early cases when the short history and absence of local induration seem to justify the exclusion of any form of treatment for the glands.

In all cases in which surgical treatment is not undertaken, the glandular areas are treated with surface irradiation with a radium mould. And in addition a radium mould is recommended as a supplementary aid to surgical dissection in all cases in which the microscopic examination of the excised glands reveals metastases.

Surface irradiation of inoperable metastases has met with only temporary and partial subsidence of the tumour masses in several cases, and the results of this form of treatment have been considered unsatisfactory. Similarly, attempts at treatment of such masses with deep X ray therapy have been unsuccessful. Recently attempts have been made to treat such cases by burying long radium needles, but the treatments have been performed too recently to indicate any results.

Results of Treatment.

The methods of treatment may be grouped as follows:

A. Primary: Radium.
B. Glands:[1] (*a*) Radium.
(*b*) Radium + surgery.
(*c*) Surgery.
(*d*) X rays.
(*e*) X rays + surgery.

The results of treatment are set out in the accompanying table.

Table showing Results of Treatment.

Class.	Number.	1[1] Alive and Free from Symptoms.	3, 4, 5, 6, 7, 8, 9[1] Treatment Unsatisfactory or Failed for various Reasons.	2[1] Apparently Cured, but Died of Intercurrent Disease. 10[1] No Information.
Operable and borderline ..	120	85=71%	20=17%	15=12%
Inoperable and very advanced	21	4=19%	16=76%	1=5%
Total ..	141	89=63%	36=26%	16=11%

[1]Refer to the Commonwealth Department of Health Statistics, Form "C", Results of Treatment.

We have attempted to analyse the cases in which treatment has been unsatisfactory or has failed. The various reasons and the following points have occurred to us. These are probably not original, but are merely the experience we have had in the treatment of a series of cases.

Regarding the appearances of metastases in glands originally impalpable and which were not treated, we have had four cases (one of an upper lip, primary). All these cases were due to the patient not attending the follow-up clinic as requested—an irrefutable argument for the routine treatment of the glandular area. We prefer surgery. Local improvement which has occurred after treatment of the whole field in our routine way appeared in one instance to bring about the occurrence of general metastases (Case B. 1245). For this we have not been able to offer any definite explanation, except the duration of the lesion (two years). One case (S. 289) occurred in a patient suffering from extensive pulmonary tuberculosis.

When the local lesion has been widespread, particularly when involvement of the jaw or generalized thickening of the submental region from lymphatic spread was present, whether gross glandular and periglandular involvement was present or not, no patient has recovered. There were sixteen cases of this kind.

When a residuum has been left after the usual treatment of the primary lesion, or when recurrence at the original site has occurred we have noticed the following conditions:

(*a*) Insufficient treatment for the extent of the lesion (there were two such cases in the series).

[1]The groups have been considered collectively as the number in each was small. Surgery was employed in 44 cases.

(*b*) Previous surgical excision has been carried out with recurrence in the scar (there were three such cases in the series).

(*c*) Marked caries in teeth and pyorrhœa (there were two such cases).

(*d*) A positive Wassermann reaction (there were three cases).

(*e*) Extensive pulmonary tuberculosis (there was one case).

(*f*) Insufficient filtration of radium (there was one case).

In the last-mentioned case the lesion, originally a rodent ulcer, was treated by needles filtered with 0·5 millimetre of monel metal; it recurred six months later as an epithelioma.

An odd case appears to fail to respond fully for no obvious reason that we have been able to detect, but on the whole practically every case in which recurrence occurred or residuum was present comes under one or more of the previous headings. If sufficient attention is given to these points, we consider that the number of cases in which residuum or recurrence occurs at the primary site should be minimized.

Necrotic Ulcer.—Necrotic ulcer has occurred in six of the cases in which radon has been used. We have ascribed this to insufficient filtration and doubt as to the strength of radon supplied and to the general condition of the patient, the latter point being illustrated by a patient aged forty-eight years, who, four years after a treatment to the lip with radium and a mould treatment of the glands of the neck, developed a necrotic ulcer in the skin under the chin.

In another case the patient developed a necrotic ulcer after treatment. He was unemployed, on rations, a heavy smoker and a heavy drinker, and his ulcer increased; this persisted for three years and healed only when he was prevented from indulging in these vices and was well fed.

Repeated doses of radium for a residuum has also caused a necrotic ulcer.

A Pyogenic Infection of the Neck Following a Mould.—A pustular infection producing characteristic appearances has been noted with relative frequency during the period of reaction from a radium mould treatment to the neck. In some instances the infection has persisted for several months before clearing up. We would appreciate an expression of the experiences of others in this respect.

Reviews.

RADIOLOGY OF BONES AND JOINTS.

IN "Radiology of Bones and Joints" Dr. James Brailsford, Lecturer in Radiological Anatomy at the University of Birmingham, has produced a volume which must be regarded as a standard work on this subject.[1]

Both the modern anatomy and pathology of bones owe much to radiology, which, during the past thirty-six years, has opened up a new field of investigation, one that might well be described as macrohistology, revealing, as it does, a viewpoint of bony architecture midway between the microscopic and the macroscopic. As indicated in the preface, radiological science, with its advanced technique, graphically provides delicate details of osseous change, which may clinch a diagnosis when clinical signs and symptoms are indefinite. By its agency many new conditions, notably Perthes's disease and the other osteochondropathies, have been described, and older conditions, such as Kümmell's disease, clarified; and fresh contributions to bone pathology are being made every year. But this information is scattered widely through the radiological and orthopædic journals, and though familiar to radiologists, pathologists and orthopædists, is slow in being made available to the general reader of surgical text books. One of the reasons for the publication of Brailsford's book is to overtake this text book "lag". The correlation of the clinical and the pathological with the radiological aspects of bone lesions occupies a prominent position throughout the volume, and Dr. Brailsford has certainly been fortunate in his orthopædic colleagues. Particularly does he place on record the helpful cooperation and advice of Mr. Naughton Dunn, who, during the past eighteen years, has supplied clinical and operative details and subsequent results of a large number of the patients whose radiographic findings are herein recorded. Most radiologists will envy Dr. Brailsford the association with such a valuable colleague.

The author contends that the radiologist of today must be not only a specialist in details and technique of radiography, but that he must take an active clinical part in scientific medical research, differential diagnosis, treatment and prognosis; unless this is done he places himself on no higher plane than a qualified technician.

Of the twenty-four chapters, all are good, but special praise might be given to that on the hip joint. Brailsford comes to the conclusion that renal rickets of Type *A* is a definite cause of the slipping of the epiphysis of the femoral head. Australian radiologists have felt that the majority of cases of adolescent *coxa vara* had an underlying basis of osteochondral abnormality around the metaphysis; but that one of the causes of the osteochondropathy may be renal rickets is an interesting and stimulating suggestion.

The general setting of the book and the radiographic reproductions are of a very high standard, and following on the recent excellent work on the alimentary tract by Arthur Barclay, Lecturer on Radiology at Cambridge, must do much to maintain the prestige of the English school of radiologists, as well as of the publishers of these works.

[1] "The Radiology of Bones and Joints", by J. F. Brailsford, M.D., M.R.C.S.; 1934. London: J. and A. Churchill; Australia: Angus and Robertson. Crown 4to., pp. 520, with 310 illustrations. Price: 30s. net.

NEUROPATHOLOGY.

THERE is no doubt but that today more than heretofore the student in neuropathology is better provided with books dealing with the histopathology of the peripheral and central nervous systems, and under such a caption Professor Hassin has presented us with another.[1] This writer is well known by reason of his illuminating studies on the reactions of the epidural tissues in *tabes dorsalis*, which he here reproduces, accompanied by excellent photographs. He maintains that an unhealthy state of the cord nutrition is set up by this epidural overgrowth blocking the free flow of fluids in the posterior spinal nerve neural sheaths and thus demyelination simply sets in. He carefully differentiates between myelitis and myelomalacia. It is obvious that he places great importance on the neural sheaths, cranial and spinal, for dealing with cerebro-spinal fluid getaway, but his views on the complete origin of this fluid are unusual. He has made

[1] "Histopathology of the Peripheral and Central Nervous Systems", by G. B. Hassin, M.D.; 1933. London: Baillière, Tindall and Cox. Royal 8vo., pp. 595, with 227 illustrations. Price: 30s. net.

observations wherein the choroid plexus is buried by inflammatory overgrowth and yet an abundance of fluid is present; these findings are contrary to those of other observers. He gives the choroid plexus but little credit for excretion, rather suggesting an opposite function.

For convenience of presentation he divides his book into four parts, dealing respectively with diseases of the peripheral nerves, diseases of the cord, diseases of the brain and, lastly, staining techniques. He is careful to indicate whether one disease may affect all three parts.

Probably the outstanding features of the book are the number of rarer neurological states brought forward, discussed and illustrated to an unusual extent. An attempt is made to correlate them with better known diseases and thus to establish some order in an otherwise chaotic collection of separate entities. Another striking feature are the number and descriptions of the histological processes involved in myelitis and neuronal *débris* removal, as revealed by the metallic impregnations of the Spanish school. The rôle of the microglia and oligodendroglia here is carefully and well rendered in microphotographs and text. This last mentioned work is so revolutionary that neurohistopathology has practically to be rewritten. We doubt whether we have seen before, in the English tongue, unusual forms of neuropathology so fully presented. To give but a few instances, one actually sees depicted in text and photograph *état vermoulu*, *criblé*, *lacunaire*, and *status marmoratus* and foam brain. Where possible, the pictures obtained by animal experimentation are given to illustrate where apparently obscure human brain and cord reactions can be reproduced quite simply in animals.

The various encephalitides are touched upon and include those of typhus fever, rabies, cow-pox, lead poisoning, plague, tularæmia, yellow fever, herpes, torula, trichiniasis, malignant endocarditis, Borna's disease, anthrax, and the common poisons, carbon monoxide *et cetera*. Vascular phenomena, birth injuries and defects are broached, and tumours of the whole nervous system, of whatever nature, are mentioned, with careful selection as to the space available.

Traumatic states are well done and heed is paid to the modern demands about the extrapyramidal system. The author ends with a judicious warning about accepting all one reads about epilepsy and *dementia præcox*. One or two printer's errors have crept in, and one cannot agree with the view that the fourth ventricle granulations in paresis (and other diseases) are chiefly endothelial, for many sections have shown them to be entirely hypertonic, underlying neuroglia. We commend his acceptance of Jacob's α, β and γ *Gitterzellen* for different stages of microglia. Too often this subject is marred by innumerable appellations for different stages and even for the same stage of mesenchyme cell or histiocyte development, which confuses the reader.

For the student no less than for the neuropathologist is this a book to be thoroughly recommended.

NEPHRITIS.

"BRIGHT'S DISEASE", by J. Norman Cruickshank, senior assistant to the Muirhead Professor of Medicine, University of Glasgow, has been written "with the object of providing the practitioner and the senior student with a short account of the clinical application of modern views of the nature of Bright's disease".[1] Revolutionary changes have occurred in recent years in our ideas of the processes underlying diseases of the kidneys. Many important problems remain unsolved and many theories used generally as a basis for diagnosis, prognosis and treatment, lack definite proof. Numerous workers are engaged in the study of these problems. There appears to be no accepted standard of classification. Acute diffuse nephritis enjoys the distinction of possessing no less than eight commonly used names. Various groups of workers publish reports from time to time on the results of their labours in that particular portion of the general problem of renal disease on which they have been engaged. It is not surprising that, as the author states, "there prevails today a surprising amount of confusion in our conception of the nature of the diseases of the kidneys grouped together under the general name of Bright's disease or nephritis".

The volume under review states clearly, concisely and comprehensively the present state of our knowledge of Bright's disease. It may be recommended confidently as a sound basis on which to build a more detailed knowledge of the many problems, clinical, pathological and biochemical, with which the practitioner is confronted in patients exhibiting symptoms indicative of disease of the kidney.

Chapter I includes a brief *résumé* of the various theories concerning the functions of the kidneys and the formation of urine. Appendix I describes the histology of the nephron and the vascular system of the kidney.

Chapter II deals with the vexed question of nomenclature. In Appendix II ten pages are devoted to the classifications of Russell and Muir. The author's own classification comprises four main groups: (i) hæmorrhagic, exudative or inflammatory, (ii) degenerative (nephroses), (iii) vascular or sclerotic, (iv) mixed. There are commendably few subdivisions.

Chapters III, IV and V describe the clinical features, structural changes found in the kidneys, course and prognosis of the various forms of Bright's disease. Nephrosis is defined as a "term used in a general way to include all forms of degenerative Bright's disease". It is refreshing to find emphasis laid on the statement that lipoid nephrosis is a relatively rare condition, and to see regret expressed that so much attention has been paid to it when the study of the more common types of degenerative disease is more likely to lead to a proper understanding of the nature of Bright's disease.

In Chapter VI the author discusses the part played by infections, chill, toxic factors, heredity, alcohol, over-eating, metallic poisons and syphilis in the ætiology of Bright's disease. He stresses the importance of extrarenal manifestations and their significance in the conception of diseases of the kidneys as a manifestation of a process of disease of the whole organism. Interesting comments are made upon the arterial spasm theory of Valhard.

Chapter VII may be described as a brief but comprehensive description of the principles employed in the treatment of Bright's disease. Sound advice is given concerning the correct use of diuretics, particularly some of the metallic preparations. Three diet sheets for use in certain types of Bright's disease are tabulated at the end of the chapter.

Chapter VIII commences with a paragraph on the limitations of the tests of renal function and then proceeds to describe those tests regarded as valuable to the clinician.

Chapters IX and XI, on œdema and uræmia respectively, are brief, but as comprehensive as could be expected in a work which belongs to the hand book class.

A third appendix describes the technical details of some methods employed in estimating renal functional deficiency.

[1] "Bright's Disease: A Clinical Handbook for Practitioners and Senior Students", by J. N. Cruickshank, M.D., D.Sc., F.R.F.P.S., M.R.C.P.; 1933. Edinburgh: E. and S. Livingstone. Demy 8vo., pp. 218. Price: 10s. 6d. net.

Notes on Books, Current Journals and New Appliances.

MARRIAGE.

DR. ISABEL E. HUTTON has published the fourth edition of her book, "The Hygiene of Marriage".[1] The book is quite useful and is written along the usual lines. Among the chapters are one on preparation for marriage, and this is followed by a chapter on consummation of marriage. The subjects of the remaining chapters include married life, menstruation and the menopause, childlessness and contraceptives.

[1] "The Hygiene of Marriage", by I. E. Hutton, M.D.; Fourth Edition; 1933. London: William Heinemann (Medical Books), Limited. Crown 8vo., pp. 156, with illustrations. Price: 5s. net.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

MEDICAL MEETINGS.

WHAT a wonderful skit on the medical profession W. S. Gilbert would be able to write were he living today and were he able to study the drama of medical practice from behind the scenes! He would find in many places enough material for half a dozen of his "Original Plays". The man who created the Lord Chancellor of "Iolanthe", Sir Joseph Porter of "H.M.S. Pinafore", Pooh Bah of "The Mikado", Major-General Stanley of "The Pirates of Penzance", would model from the ranks of medicine figures just as amusing as these, just as convincing, and just as true to life as he chose to see it. The general specialist would surely be depicted, so would the specialist general practitioner. The dignity of the physician, the magnificence of the surgeon, the persuasiveness of the gynæcologist, the fortitude of the tonsillectomist, the all-seeing eye of the radiologist, the unshakable faith of the physical therapist, and, yes, the omniscience of medical journals—all these in Gilbertian garb would be a delight. What a picture a Gilbert could paint of incidents in the life of a general practitioner! In his hands, for example, the efforts of a suburban practitioner to secure admission to a public hospital of a patient suffering from an abdominal crisis might make an appeal like that of the orphan boy in "The Pirates". Whatever plan the resurrected Gilbert chose for the building of his medical satire, he would certainly devote one act to a scientific medical gathering. He would have his assembly hall full of eager practitioners, the so-called leaders of the profession would all be there, and even university teachers might be present to take part in the discussion. But here we must leave to the reader's imagination the completion of the scene. This will be a salutary exercise, for medical practitioners, like other people, get into a rut, they are wont to lose their sense of humour as far as their own activities are concerned, and every now and again they need some sort of jolt that will readjust their sense of values.

Medical meetings are not what they were. Nothing ever is. Medical meetings are too pleasantly polite. Nowadays we see none of the stimulating wordy battles that were a joy to the youthful twenty-five years ago. Nearly every one who takes part in a discussion thanks the speakers for their excellent papers. The papers may have been good; they may have been merely a statement of other people's views, badly put together and badly delivered; but that apparently does not matter. Though this excessive politeness becomes wearisome after a time, it is not really important. What is important is that the discussion is sometimes made almost valueless. For this there are several reasons. In the first place the spirit of the meeting may be broken by some meandering person, most likely opposed in private practice to one of the readers of the papers, who traverses again most of the ground covered in the original paper without adding anything worth while either in the way of criticism or of new matter. The chairman should keep such a person strictly to his time limit. The audience is not impressed by the meanderer's efforts—it is merely bored. Then we have the irrelevant speaker. Possibly he is a budding young specialist who, without knowing what line the discussion is likely to take, has been at great pains to cull from recent journals information on what he thinks will be the aspect chosen. He produces these notes and reads them while his seniors feel sorry

for him and his juniors remain unconvinced of his erudition. There are also perhaps one or two members, constant attendants as a rule, who are expected to be facetious. They try to come up to expectations, but at the expense of the value of the discussion; if they do not speak, the chairman most likely calls on them. People of the kind mentioned would do well in a Gilbertian symposium, but they spell failure to a scientific discussion.

Discussions at Branch meetings should be conducted in accordance with the rules of procedure that have been laid down. Time limits should be observed and irrelevance should be checked by the chairman. Some chairmen develop the habit of inviting certain members from the audience to speak. This is a mistake for several reasons. In the first place, if a man has a message he should give it without being asked. Secondly, members called upon by the chairman do not like to refuse, and, though they have no message, they take up the time of the meeting to no purpose. Thirdly, as a rule only senior members are invited to speak, and this gives rise to the complaint sometimes made by the younger members that Branch discussions are for senior members only. When discussions are to take place, one or more speakers should be asked to contribute opening remarks; these members, after conference with the readers of the papers, could address themselves to different aspects of the subject. If, when these speakers had concluded their remarks, the chairman insisted on the rules of debate being observed, meetings would be more attractive and attendances might be larger.

Current Comment.

JAUNDICE IN SYPHILIS.

For very many years it has been known that jaundice was an occasional complication of syphilis. It is, however, uncommon, and when increasing numbers of cases began to be observed after the introduction of the original "Salvarsan" it was realized that the specific therapeutic agent was also a specific factor in producing jaundice. But the experience gained in the World War introduced other possibilities, for epidemics of catarrhal jaundice, usually considered to be infectious, occurred both in the civilian and military populations, and this confused the issue. Even apart from the chance of coincident infections, the question arose whether jaundice might be due in some cases to a recurrence of the syphilitic process in the liver during a lull in intensive treatment, even as it occurs in the nervous system. These aspects of the subject are dealt with by U. J. Wile and W. M. Sams in a recent communication.[1] They state that they observed only two cases of jaundice among 1,065 cases of early syphilis, an incidence of 0·18%. The treated patients receiving drugs of the arsphenamine group showed a much greater incidence, 1·35%. In these latter no definite relation was found to exist between the severity and duration of the jaundice and the amount of the drug given, but the type of drug employed seemed to be of some importance, for the neo-arsphenamine type appeared to be less hepatotoxic than others. The authors thinks also that they have observed different results in this regard with different brands of the same drug. This post-therapeutic jaundice may occur either early or late. The early cases are ascribed to purely toxic action of the drug on the liver cells, due to overdosage or to idiosyncrasy, or to a Herxheimer reaction. These are as a rule more or less benign and are less controversial in nature than the later attacks, which usually come on after the patients have had one or more courses of arsenical injections and, while having other heavy metal treatment, are awaiting a continuance of the arsphenamine. The question here is whether the cause is a delayed toxic action on the liver, a recurrence of syphilis in the liver, or an intercurrent infection. That the first hypothesis is in some measure true seems likely. The authors quote the figures of Ruge, who found that jaundice occurred sixteen times more frequently among the personnel of the German Navy treated with arsenic than among others, and they point out that the toxic effect of the drugs cannot be denied. It is interesting that patients who have had late jaundice are not necessarily intolerant of the arsenicals thereafter, even though the drug plays so important a part. But the precipitating factor of the hepatitis is the obscure link in the chain. That this accessory factor is a putative recrudescent syphilis of the liver is not accepted by Wile and Sams as likely. They remark that it is difficult to assess liver damage at any time unless it is sufficiently gross to cause a very serious dislocation of hepatic function, for the reserve is so ample. But although they do not doubt that so important and vascular an organ as the liver must invariably be affected by a systemic disease such as syphilis, they do not think the evidence favours this theory. They point out that in any case jaundice is not a distinctive feature of known hepatic syphilis. The last suggestion that there may be some connexion between this late form of icterus and intercurrent infection is more difficult to deal with. Wile and Sams make an attempt to compare and contrast the symptomatology in the post-arsphenamine group

[1] *The American Journal of the Medical Sciences*, March, 1934.

and the known catarrhal or infectious group. From this study it would appear that a differential diagnosis is virtually impossible in many, if not most, of the cases, unless one knows the history. This is about what one would expect, however, for after all the ultimate pathology of the two conditions must be much the same. The rôle of the heavy metals, such as mercury and bismuth, is also considered, but they are not thought to play more than a merely contributory part.

No definite conclusions seem to be reached by the authors, but they truly remark that it cannot be denied that syphilitic infection itself places some load upon the liver. When to this is added the effect of a drug known to be in some degree toxic to the liver, one need only postulate some other factor, perhaps not weighty of itself, that may swing the balance in favour of a slight cellular spoiling in the organ sufficient to cause jaundice. This factor remains hypothetical; it may be the result of intercurrent infection, other causes of lowered resistance, or extraneous intoxication, as by alcohol or pregnancy. The authors did not find either of the last named of much significance in their series. They include also a brief account of jaundice occurring during malarial therapy; and in regard to this they remark that the combination of malaria and arsenic is more potent to produce jaundice than either singly.

In conclusion it is pointed out that the arsphenamine drugs in their present forms are undoubtedly somewhat toxic to the liver. This may not, and indeed need not, worry us unduly, for evil results are rare, but acute yellow atrophy is always a possibility, and the appearance of any jaundice, however benign it seems, is a signal for caution. The degree of susceptibility and hepatic resistance in individual patients can only be surmized at present. Thus we can but accept the risk of toxicity as we do with other potent drugs, always remembering that arsenical preparations should not be given to jaundiced patients.

THE SURGICAL TREATMENT OF ASCITES.

SEVERAL operations have been devised for the relief of ascites due to cirrhosis of the liver. The object in most of these operations is the drainage of the fluid into the systemic circulation. In some cases the treatment has effected great improvement, not merely in the local condition, but in the general health as well. Repeated *paracentesis abdominis* has occasionally led to recovery from ascites, presumably on account of the establishment of drainage through adhesions between the abdominal viscera and the parietes; but reliance cannot be placed on this method of treatment; as a rule temporary relief is all that can be expected from it. When ascites is so severe as to require frequently repeated paracentesis, the patient is bedridden as a rule for the short period of life remaining to him; he is relieved, at intervals, of his discomfort, but pays for his relief by the sacrifice of large quantities of nutrient fluid. When drainage into the systemic circulation is established, this nutritive material is saved, and the continuance of life in some comfort is made possible. For this and other reasons some authorities believe that operations holding out even moderately good prospects of success are justifiable in the treatment of ascites due to hepatic cirrhosis. The patient is so ill that he endangers his life by submitting to a major operation; but his life will last a few months at most if he is treated expectantly.

F. C. Fraser has recently described a case in which he employed a new method for the treatment of ascites.[1] The patient was an Indian child, aged three and a half years, who developed ascites after an attack of jaundice. He received no treatment for four months. When admitted to hospital he was emaciated and so weak that he was unable to stand; the ascites was extreme. Medical treatment was given and repeated paracentesis was performed over a further period of four months. Fraser then performed an operation consisting in splitting the omentum and anchoring the two sections between the abdominal muscular layers; this failed to give relief, paracentesis being required eleven days later and repeatedly during the succeeding month. Fraser then performed a second operation. He made an incision from the pubic symphysis to above the umbilicus, and stripped the parietal peritoneum from the abdominal wall on either side of the incision, almost to its reflexion to the ascending and descending colons. The bleeding was easily stopped by the application of swabs soaked in hot saline solution. Fluid collected slowly for twelve days after the operation, then rapidly disappeared. "Simultaneously, a very striking network of veins sprang into appearance on the thorax, some of the veins being quite varicose and extending to above the clavicles." The child was discharged from hospital on the twentieth day after the operation, and when seen a month later was "running about happily".

Fraser admits that there is a risk of intestinal obstruction after his operation, due to the massive adhesion between bowel and the abdominal wall; but he points out that even when their intestines are matted together and fixed to the parietes, many patients with tuberculous peritonitis are able to live for years in comfort. He concludes with this remark: "The outlook in intractable ascites is so hopeless that almost any risk is justifiable."

The surgical treatment of ascites has been neglected. This is perhaps largely because the patient appears unlikely to live long whatever treatment is employed. But desperate illnesses demand desperate remedies, and if operation is likely to rid the patient of his discomfort and prolong his life, there is sufficient reason for its performance, even at the risk of fatal shock. Fraser's operation is severe; it would necessitate the greatest care on the part of anæsthetist and surgeon.

[1] *The Indian Medical Gazette*, February, 1934.

Abstracts from Current Medical Literature.

RADIOLOGY.

Tumours of the Spinal Cord and Associated Soft Tissues.

JOHN D. CAMP (*Radiology*, March, 1934) states that osseous changes that directly localize the lesion can be demonstrated radiographically in about 50% of all tumours of the spinal cord and associated soft tissues. In his series the percentage of cases in which bone changes were detected varied considerably with the different groups of tumours. The following figures concern the more common lesions: neurofibroma (65%), endothelioma (11%), ependymal-cell glioma or caudal tumour (66%), hæmangioma and hæmangio-endothelioma (33%), intramedullary tumours, exclusive of ependymal-cell glioma (none). In interpretation of the Röntgenograms, close attention must be paid to the shadows of the vertebral pedicles and laminæ, since these structures usually present evidence of a contiguous tumour before it is discernible in the body of the vertebra. Changes in the shadows of the paravertebral soft tissue may portray extravertebral extension of a neoplasm. All benign tumours originating within the spinal canal involve the bone in a similar manner; that is, by erosion from pressure. They have no individual distinguishing Röntgenological characteristic, except the neurofibromata, which have a tendency to extrude through an intervertebral foramen, producing an hour-glass tumour, partly within and partly without the spinal canal. As the tumour enlarges, the adjacent portions of the vertebra are eroded by direct pressure and pulsation of the spinal cord and vessels. The margins of the eroded area are sharply demarcated, and coincide with the surface of the contiguous tumour and displaced spinal cord. These changes rarely occur in the absence of partial or complete block of the spinal canal, unless the tumour is held in contact with the bone by a nerve root or meningeal attachment. One or both pedicles of the vertebra at the level of the tumour usually exhibit evidence of erosion before it can be discerned in the laminæ and body. The pedicle is first flattened on the medial aspect and the cortical bone is rarefied. As the tumour grows, the surface of the pedicle becomes concave, coinciding with the surface of the mass, and, lastly, it is entirely destroyed. At this stage, if the tumour is a neurofibroma, it may extend along the course of the posterior nerve root and extrude through the intervertebral foramen, which it also erodes and enlarges. Later the tumour within the canal enlarges, the pedicles of several vertebræ may be involved, and at this stage neurological signs are usually definite. In the interpretation of changes in the pedicle one must not be misled by the unilateral pseudonarrowing of pedicles incident to scoliosis and rotation of the spine. Erosion of the body of a vertebra is usually recognized later than changes in the pedicles or laminæ. The erosion may be localized and discrete, coinciding with the shape of an adjacent tumour, or the body may be uniformly flattened or hollowed out on its posterior surface if the neoplasm is large. The intervertebral disk and median *raphé* are particularly resistant to erosion from pressure. Malignant tumours arising from soft tissues within the spinal canal include both primary and metastatic lesions. The intramedullary tumours, particularly the gliomata, with the exception of the ependymal-cell gliomata, do not commonly involve the vertebræ secondarily. Since these tumours originate within the spinal cord, serious neurological signs usually occur long before the growth has expanded the cord sufficiently to erode the surrounding bone. The other tumours, consisting chiefly of various forms of sarcoma, lymphosarcoma, malignant hæmangio-endothelioma, and metastatic growths, destroy the surrounding vertebræ by direct infiltration, and thereby produce the well recognized Röntgenological picture of malignant disease in bone.

Intervertebral Disk in Certain Spine Lesions.

EUGENE FREEDMAN (*Radiology*, February, 1934) states that changes of the intervertebral disk can be evaluated only as an index of a vertebral lesion. Due to the close relationship of the vertebra and disk, not only tuberculosis, but the great majority of infectious spondylitides may extend into the disk during some stage of the disease. A primary infection of the disk is possible in younger individuals, without involvement of the vertebral body, producing a marked narrowing or a complete obliteration of the intervertebral space in the Röntgenogram. Although in the great majority of instances the disk is definitely narrowed on the Röntgenogram in tuberculous spondylitis, cases are known in which the width of the disk has not changed; in one of the author's cases it was even wider than normal. *Spondylitis typhosa* seldom occurs before the seventh week after the onset of illness, there usually being a symptomless interval between the typhoid fever and the onset of the spinal symptoms, of three to eight weeks. However, there are cases reported in which the interval was from three to eight months. The disease has two forms, the spondylitic and the perispondylitic. In the first form, which is rare, necrotic areas occur in the vertebræ and transverse processes. The vertebral body may collapse. In the second form the involvement is mainly localized in the periosteum and disk. This form represents the most common manifestation of typhoid spondylitis. During the first stage of the disease Röntgenological examination reveals no abnormality; but from three to six weeks later, changes of the intervertebral spaces are demonstrable. They become more opaque, their width diminishes, and finally the two vertebræ unite. Periosteal new bone production is common.

Hip Joint Changes in Hæmophilia.

MAX KAHN (*Radiology*, March, 1934) states that hæmophilic arthropathy most frequently involves the knee joints, followed in order of frequency by the elbows, ankles and hip joints. In the first or second year of the joint disturbance Röntgenographical examination generally reveals no abnormality. Later, when limitation of movement occurs, Röntgenography will reveal atrophy of the neighbouring bones. This is followed by destruction of the joint surfaces, with irregularities resembling those of *arthritis deformans*. The joint cartilage disappears and the joint surfaces approach each other. Synostosis may occur. Accompanying these intra-articular changes there are usually periarticular manifestations. The earliest of these may be a hazy shadow in the soft parts, caused by periarticular hæmorrhage, which later may be followed by calcification and ossification. The bones in the neighbourhood of the joints become enlarged and broadened across their articular surfaces. In the early stages the Röntgenological changes may resemble those of tuberculous osteochondritis or *coxa juvenilis*; later, they simulate *osteitis deformans*. Important factors in the differential diagnosis are the patient's history and family history and the short duration of the pain (four to six days). It is only when there are marked periarticular shadows, with signs of ossification about the joint, that the Röntgenograms may be characteristic.

Pneumonokoniosis.

JAMES DUBROW (*Radiology*, February, 1934) states that in pneumonokoniosis there are even more extensive lesions in the tracheo-bronchial lymph nodes than in the lung. The sinuses are in most places obliterated by reaction to excessive amounts of dust or by healed and calcified tubercles. In other places they are greatly dilated. Around the node is dense fibrous tissue, which has caused a dilatation of the afferent lymph vessels. The primary lesion of pneumonokoniosis is in the tracheobronchial lymph nodes, and their partial obstruction by healed foci of infantile tuberculosis has a determining influence on the rapidity with which workmen develop pneumonokoniosis. Thus if a workman has such healed foci, he will develop sufficient connective tissue in a relatively short time to complete the obstruction to the lymph flow, hence the dust, finding no other egress, will accumulate in the lung.

PHYSICAL THERAPY.

Irradiation of the Parathyreoid Region.

E. A. MERRITT (*The American Journal of Roentgenology and Radium Therapy*, November, 1933) states that, theoretically at least, the best treatment for parathyreoidism is radiation therapy, and while all the cures of cystic bone disease hitherto reported have followed surgical removal of one or more parathyreoid glands, there are and always will be obstacles which render surgical attack so difficult that irradiation, if reasonably successful, will become the method of choice. The author then supports his contentions by describing three cases, giving history, symptoms, X ray findings and treatment in detail.

Radiation Therapy of Keloid and Keloidal Scars.

FRED M. HODGES (*The American Journal of Roentgenology and Radium Therapy*, February, 1934) discusses different methods of treatment, such as the use of pepsin, hydrochloric acid, formalin injection, oil of creosote and surgery, and states that they have all been replaced by radium and X ray therapy. He goes on to describe the different radiation techniques used by the various authorities on the subject. The authors says that in his experience thick localized keloids should be removed surgically and then irradiation employed; but in the majority of cases seen this is not possible on account of the size of the involved area. In all small keloids irradiation should be used, because the pain disappears quickly, also the keloid itself. In large areas it is often necessary to wait a year to see a good result. He suggests that the earlier the keloid the greater the chance of quick cure; but then again the patients do not present themselves until some considerable time has elapsed. The technique given is 200 to 250 *r* unfiltered X rays every five to six weeks for early keloid or keloidal scars, up to 300 *r* for larger lesions. Unsightly deformities due to contracture are relieved without surgery; but where there are broad white bands of dense fibrous tissue in addition to the scars, the bands should be removed by operation.

Teratoma Testis.

RUSSELL S. FERGUSON (*The American Journal of Roentgenology and Radium Therapy*, March, 1934) gives many tables of the quantitative estimation of prolan *A* in the urine before and after irradiation. He recommends the use of this quantitative estimation in the diagnosis of *teratoma testis*, and suggests that the classification of the disease be more on biological lines, because the diagnosis of radio-resistance on histological grounds is not a safe criterion on which to select treatment. He shows that the biological response to the therapeutic test of irradiation is the only safe criterion of radio-sensitivity, and at the same time is an accurate prognostic index. He goes on to point out that pathogenesis and pathological anatomy of *teratoma testis* contraindicate the selection of either simple orchidectomy or the radical operation of Chevassu-Hinman as an efficient method of treatment. He gives a series of 154 unselected cases and shows that the irradiation results are superior to those of radical surgery (29·2%, as opposed to 17% obtained by Hinman). It is well demonstrated that the results of irradiation have been definitely improved by the adoption of the routine biological assay of the urine for prolan *A*, and that therefore the future results should be greatly improved. The author works out the radio-sensitivity in the different types and gives pathological descriptions. He condemns radical surgery and quotes other authors' statistics to support him. Out of one hundred patients treated for *teratoma testis* by radical operation, seventeen are alive without evidence of disease five years after. The author states that the irradiation figures are better and that they are improving.

Benign Hypertrophy of the Prostate Gland.

BENJAMIN S. BARRINGER, ARCHIEL L. DEAN, JUNIOR, RALPH E. HERENDEEN AND JAMES J. DUFFY (*The American Journal of Roentgenology and Radium Therapy*, March, 1934) discuss the treatment of benign hypertrophy of the prostate gland. The primary object in their work was to ascertain if in any appreciable number of cases operative removal might be replaced by X ray therapy. They report 34 cases, dividing them into two groups: those in which the residual urine measured 60 cubic centimetres and over, and those in which it was less than 60 cubic centimetres. In seven (30%) of 23 cases in the former class the residual urine decreased in quantity as a result of X ray therapy In nine out of 21 in the second class the residual urine remained the same or decreased. The authors go on to describe the examination and technique of treatment and the effects of radiation, and then give some of their case histories in detail. In conclusion they observe that the œdematous prostate entirely loses its œdema under X ray treatment, and they suggest that many patients are operated on because of this œdema. They conclude by saying that the simple bilateral lobe hypertrophy is the type most suitable for X ray therapy and that X rays should also be used on patients with cardiac failure or bad kidney function, and very old people.

Carcinoma of the Cervix Uteri.

WILLIAM P. HEALEY (*The American Journal of Roentgenology and Radium Therapy*, January, 1934) remarks that the treatment of cancer of the *cervix uteri* has been largely transferred to the realm of radiation therapy, because the disease is seldom recognized early enough to permit of satisfactory removal and because cervical cancer is accessible and radio-sensitive. The author has studied 1,574 patients with cancer of the cervix at the Memorial Hospital, New York, and found that 12·5% had an early lesion limited to the cervix and that not all these were as curable as they at first appeared. He strongly urges external irradiation immediately after the application of radium in all these early cases, and herein lies the hope of improving the cure rate in the future. In support of the importance of external irradiation he quotes the rise in Regaud's statistics since he employed this method as a routine The author strongly believes that better results are obtained by preparing the field for radium application by beginning with the external X radiation. Within two weeks the local lesion is smaller, cleaner and firmer, and radium can then be applied to greater advantage. Attention is being drawn more and more to bladder and rectal complications. The author states that he does not see many bladder ulcers *et cetera*, but if ulceration occurs, a biopsy ought to be taken, in case it is mistaken for metastases. Intestinal lesions are very rare.

Hyperthyreoidism.

THOMAS A. GROOVER AND ARTHUR C. CHRISTIE (*Radiology*, March, 1934) report 252 cases of hyperthyreoidism for the period 1928 to 1931, and wisely remark that there is far more in the treatment of hyperthyreoidism than either surgery or irradiation connotes. They point out that the radiologist must be his own physician in charge of the case, with consultation when necessary. The fallibility of basal metabolic determinations is stressed. The authors suggest putting all very toxic patients to bed for about six weeks, and point out that mental tranquillity is no less important than physical rest. Foci of infection are sought and dealt with before irradiation. Technique is described in detail. The authors do not know of any contraindications to irradiation and do not see any reason to combine surgery and irradiation, except when one has failed to cure. Over a period of sixteen years 557 patients have been treated and no malignant changes have supervened in any one case. Seven patients (2·38%) only had to be sent for surgery after irradiation had failed. Five patients (2%) developed hypothyreoidism, but there were no other sequelæ. The writers conclude by comparing irradiation with surgical methods and stating that the only vital consideration as to choice is that irradiation therapy is unattended by mortality, whereas the mortality following operation, although low in the hands of an experienced goitre surgeon, is considerable in the hands of the average general surgeon, and therefore falls short of the ideal in treatment.

Special Articles on Treatment.

(Contributed by request.)

XXXII.

THE TREATMENT OF ANGINA PECTORIS.

THE rational treatment of *angina pectoris* implies ability to recognize the syndrome in its various guises, to differentiate it from other disorders associated with anterior thoracic pain, and finally to understand its ætiological bases.

The classification used by me embraces three main groups:

A. Cardio-aortic *angina pectoris*, including aortitis and coronary thrombosis and *angina pectoris* in the usual paroxysmal form.

B. Neurogenic *angina pectoris*.

C. Mixed types, including combinations of *A* and *B*.

Generally speaking, the diagnosis of the anginal syndrome and of the type will be arrived at by a careful history, which includes a full detailed description of the incidents associated with the attacks, the area of pain, its severity, duration, and associated phenomena. Such a history, combined with the examination, will usually unmask both the type and the ætiological factors.

In the neurogenic type the basis of symptoms is a hypersensitive nervous system and disharmony of balanced reflex mechanisms which readily get "out of step". Sedatives constitute the principal part of the treatment. Such drugs raise the threshold to pain stimuli by damping down the receptor elements in the nervous system. The barbiturates and bromides offer a wide range of choice. My own preference is for phenobarbitone, compared with bromides. It is less depressing, causes less mental confusion, and is far less likely to cause drug rashes. However, skin lesions and pruritus may occur. The dose necessary for phenobarbitone or its sodium salt (p.solubile) varies according to the degree of nerviness, anxiety and insomnia. A dose of 0·015 to 0·03 gramme (one-quarter to one-half of a grain) *bis die* or *ter in die* is usually sufficient. An extra 0·03 gramme (half grain) may be added for restlessness or sleeplessness; or the doses may be administered at the latter part of the day, for example at 2 p.m., 7 p.m., or 10 p.m. As improvement occurs, reduce the number of doses. If bromide is used, the ammonium salt is preferable in doses of 0·3 to 1·2 grammes (five to twenty grains) *ter in die*. In several cases chloral hydrate (0·6 to 0·9 gramme or 10 to 20 grains) three times a day may be given, and in inveterate cases opium and *Cannabis indica* may be tried. Alcohol will produce rapid feelings of well-being by mildly narcotizing the higher perceptive faculties, thus damping down unpleasant sensations. However, habit is so readily induced and the associated effects of visceral deterioration are so likely to occur that its routine use is debarred. Sedative treatment is merely symptomatic and, although the immediate good effects are gratifying, one must not rest content if lasting benefit is aimed at.

Investigation is necessary to elucidate the basis of the unstable hypersensitive nervous system. It may be inherent or acquired. Usually anxiety neurosis is marked and some form of psychical disharmony is present. Fatigue and exhaustion neurosis are also common. Frequently toxic factors complicate the picture, so that a combined psycho-toxic state exists. Both elements need appropriate treatment. Psychical reeducation and adjustment are a tedious process and may need the assistance of a trained worker in this field. Suggestion and faith are potent remedial measures; confident assurance that the pain is harmless and that the condition is more of a nuisance than a disease aid very materially. As long as fatigue is avoided, exercise need not be curtailed in neurogenic angina. Nine hours of rest are indicated; diet restrictions are usually unnecessary. Tobacco may need to be omitted. There is no doubt in my mind that tobacco angina is a real entity.

Sources of focal infection may need eradication, but this requires careful selection of cases, as nerviness may be increased by the ordeal of operation. The chief desiderata are the use of adequate premedication, the minimum of general anæsthetic, and the least possible operative trauma.

Consideration will now be given to treatment of the common type of paroxysmal *angina pectoris*. The pathological bases are coronary sclerosis, myocardial degeneration, and sometimes aortitis. In the last mentioned the orifices of the coronary arteries are often involved.

In practice we encounter all grades of severity, ranging from comparatively mild, infrequent spasms of pain to various degrees, till we meet with those distressing cases in which the slightest effort induces an attack; even the exertion of sitting up or dressing precipitates pain. In these patients advanced coronary disease is present and the prognosis is extremely serious. In fact, many sufferers have advanced, irreversible, pathological changes, so that amelioration of their sad lot is alone possible.

However, in all cases attention should be directed to details of diet, the relative amount of rest or exertion, avoidance of excitement and of exposure to cold.

A great number of anginal patients complain of flatulence, and experience undoubted relief by eructations. On the other hand, air swallowing, aerophagy, is often developed and should be checked. "Martyrs to indigestion" should be asked to demonstrate what happens in the attack, and one should note whether gulping movements are made. The air swallower should be instructed to keep the mouth open when the desire for belching occurs. In inveterate cases the patient may hold a cork or mouth prop in position.

As regards diet, patients ought to avoid the indigestible foods, in particular fresh bread, scones, pastry, suet puddings, cabbage, parsnips, other coarse or tough vegetables, pickles, pork, beef, corned meats, smoked fish, lobster *et cetera*. Generally speaking, most patients have learned by experience the diet that best suits them. It goes without saying that meals should be of the light type, given at regular intervals, and be well masticated. The principal meal should be in the middle part of the day.

In those patients who readily experience pain on exertion, following meals, a rest of at least half an hour is indicated. Incidentally such cases are often mistakenly diagnosed as indigestion. Heavy suppers should be strictly avoided, as they may be the exciting cause of coronary thrombosis. A tumbler of hot water with half a teaspoonful of sodium bicarbonate and a few drops of peppermint added is a useful, though possibly unattractive, "night cap". Whisky may be permitted at bed time to those who have accustomed themselves to its use as a soporific.

The problem of rest and exercise is a most important one. In severe cases a long rest in bed is indicated, varying from four to eight weeks. In milder cases, in which a moderate amount of exertion can be undertaken without anginal pain, curtailment of exertion is all that is necessary. The rule for general guidance is that the patient should keep well within his limit. He should avoid the attack by moderating the walking pace, limiting the distance attempted, avoid inclines, stairs *et cetera*. Walking against cold winds is a common cause of attacks. (No doubt the cutaneous vaso-constriction increases the work of the heart.) Even entering a cold bedroom or getting into a cold bed may be sufficient to induce an attack. The room should be warmed and hot bottles placed in the bed, or the patient may sleep between blankets.

Unfortunately it is true that a period of rest will not always prevent angina or even lead to permanent improvement. Indeed, attacks of coronary thrombosis occur not uncommonly in bed; probably because circulatory stasis conduces to thrombosis at the site of atheromatous degeneration in the coronary arteries.

However, if there is a ready tendency to the production of dyspnœa, pain, signs of congestive failure or very high blood pressure, rest is essential in the first place, supplemented by appropriate treatment.

It is only in quite mild cases with good exercise tolerance that games, such as golf, should be permitted. Bowls may be more readily allowed in suitable weather, but competitions should be forbidden. Every case of angina (excepting the neurogenic variety) is a potentially bad risk, with the sword of Damocles hanging by a slender thread. Atropos is every ready to cut the thread, whether the victim be at rest or in the act of some form of exertion.

Nevertheless it is rarely advisable virtually to imprison the unfortunate patient; some enjoyment and some risk are justifiable. Those engaged in public life, committee work *et cetera*, who feel the strain of speaking in public, would do well to resign from such activities. Similarly, card players who are affected by excitement should not play for high stakes or else should seek a less exciting pastime.

In many cases of angina smoking has a deleterious effect and should be discontinued. Excessive cigar smoking (less common in these days of economic depression) is the most harmful form of indulgence. Regarding alcohol, it should be allowed only in moderate quantities to those who are accustomed to it, but not in the presence of dyspepsia, cholecystitis, cirrhosis or renal involvement. Angina complicated by other diseases obviously increases the difficulty of treatment. Focal infection and reflexigenous sources of nerve irritation need elimination so far as is practicable.

Dental extractions should be performed with the aid of local anæsthesia or nerve block. If general anæsthesia is required for any operation, adequate sedation followed by gas and oxygen is the method of choice. It should be remembered that, except in expert hands, gas administration is not specially safe. Every care should be taken to avoid anoxæmia and struggling, which are highly deleterious even to the normal myocardium.

Gall-bladder disease is a frequent concomitant of angina, and if operation is needed, it is doubly essential to have a capable anæsthetist and a surgeon who will operate with gentleness and avoid dragging and squeezing the liver, and who will use every source of technique to avoid shock.

The indications for drug treatment of the underlying pathological basis of angina are to remove, improve or prevent progression of arteriosclerosis in particular. Further, it is necessary to improve or remove fatty and fibrous degeneration, to eliminate toxic causes, syphilis *et cetera*; also to insure coronary vaso-dilatation in order to promote nutrition of the myocardium.

Symptomatic treatment is necessary for pain, insomnia, dyspepsia, dyspnœa *et cetera*. It must be confessed that our ability to fulfil the indications in the pathological sphere is decidedly limited. Advanced pathological change so frequently confronts the clinician that the outcome is largely a matter of chance whether the patient lives days or years.

Potassium iodide is traditionally used, in the hope or faith that it will alleviate arterial degeneration and reduce blood pressure. It acts best in cases of subthyreoidism and chronic syphilis. Lugol's solution, or *liquor iodi mitis*, given in milk, may be used. I am not convinced that organic compounds usefully replace inorganic preparations. If the former are less prone to cause drug rashes, it is because they are less readily absorbed. A useful prescription to mask iodide is to add compound syrup of glycerophosphates and extract of liquorice. If syphilis is present, appropriate treatment is indicated by means of repeated courses of iodide, mercury, bismuth, and neoarsphenamine or sulpharsphenamine. The usual precautions to avoid toxicity and too rapid change are necessary. It is needless to supply details in this article.

In patients with excessive fatness, thyreoid gland tablets should be used in doses of 0·03 to 0·06 gramme (half to one grain), three times a day, and increased slowly in suitable cases. Theobromine is a useful coronary dilator. It may be administered in doses of 0·3 to 0·6 gramme (five to ten grains), to be taken three times a day. It is less likely to cause nausea than theobromine sodium salicylate ("Diuretin"), theophyllin, or "Euphyllin".

Tablets of theobromine (0·3 gramme or five grains) and phenobarbitone (0·03 gramme or half a grain) are an efficient combination, particularly where nerviness and anxiety are prominent symptoms. They should be persevered with for some months. Bromides on the whole are less useful, but find a place in treatment as sedatives, and sometimes are of service combined with barbiturates.

It would serve no useful purpose to mention all the numerous drugs advocated in the treatment of angina. In passing, I may state that I have not been impressed by "Lacarnol", mistletoe extracts, and various proprietary preparations. Glucose, with or without insulin, has its advocates, but my own experience, which is limited, does not make me enthusiastic. Nitrites are of benefit for the attack, but of little use for routine treatment. In a few intractable cases I have considered surgical division of the nerve pathways or sympathetic ganglion injection to relieve frequent recurrences of pain. In each instance death has supervened before intervention, so that I lack personal experience of these methods, which have keen advocates in America and Europe. The present tendency, at least in America, is in favour of injecting the cervicodorsal ganglions corresponding to the area in which pain appears.

The ordinary attack of angina is commonly relieved by vaso-dilating agents; even a hot drink, spirituous or otherwise, may suffice. Nitrites are particularly valuable remedies. Patients should never be without a supply of nitroglycerine tablets, which can be conveniently carried in a pocket. Unless the pain disappears promptly a tablet should be chewed or swallowed whole and may be repeated in five or ten minutes if necessary.

A useful precaution for those who get attacks with a known degree of exertion, such as walking to train or tram, is to take a tablet to anticipate the attack. In this way pain may not eventuate. Untoward effects from the frequent use of nitroglycerine (*glycerylis trinitratis*, B.P., 1932) are sufficiently rare to be disregarded in practice. Inhalation of amyl nitrite is certainly very efficient, but it causes unpleasant throbbing of arteries, flushes and palpitation. Moreover, the fall in blood pressure is very abrupt, transient, and often succeeded by a rise to higher levels. The abrupt drop in pressure may cause faintness or even unconsciousness. In my opinion, amyl nitrite capsules are not as useful as trinitrin tablets for ambulatory patients, and the greater cost is a fact of practical importance. Other types of nitrites may be used, such as nitrite of soda, erythrol tetranitrate, mannitol nitrate, or combinations of these; but for general use nitroglycerine is the best. *Liquor glycerylis trinitratis* (1%) in minim doses may be used, and on the whole it is less likely to deteriorate than the tablets, but is less convenient.

The anginal pain of coronary occlusion is usually of very great severity and very persistent. Restlessness may also be extreme. Of all drugs, morphine alone can be depended on to relieve the great distress. The dose necessary is measured by the distress. Usually 0·015 gramme (one-quarter of a grain) should be administered hypodermically, and it may be repeated in fifteen minutes. In very violent cases 0·03 gramme (one-half of a grain) of morphine may be justified. However, it is well to remember that morphine is also a lethal agent, and heroic doses should not be too heroic. If the breathing centre is very depressed, it may be stimulated by "Coramine" injections and inhalations of 5% carbon dioxide.

Once the restlessness and pain are controlled, absolute rest is indicated for about seven days. Nursing should be as careful as in cases of diphtheric heart. All undue movement must be avoided and every care should be taken to insure quietness and rest. The patients need warmth to combat the shock. They should not be permitted to get out of bed for bowel evacuations; by the use of oil enemata or a gentle bowel wash-out the nurse should be able to get the necessary result with the least possible disturbance of the patient.

Small amounts of nourishment at a time are given, and dextrose powder provides a ready means of supplementing the calorific requirements. It is less nauseating than liquid glucose, and 60 cubic centimetres (two ounces) or more per day may be given.

As the severity of the myocardial disablement passes off, and as the blood pressure and pulse improve, then the patient may be allowed more movement in bed. The total rest period should be about six to eight weeks. Digitalis is unnecessary, unless congestive failure or auricular fibrillation is present. Nitrites should not be used, as the blood pressure is already low, and sudden lowering favours extension of thrombosis. Stimulant injections, such as caffeine sodium benzoate or "Coramine", may be of service. Theobromine is valuable as a coronary dilator in doses of 0·3 to 0·6 gramme (five to ten grains) three times a day. If anxiety, restlessness or insomnia are troublesome, phenobarbitone is usefully added. It is well to remember that not all cases of coronary thrombosis are deadly or even extremely serious. Occlusion may occur in small branches of the coronary arteries and the myocardial dysfunction is relatively slight, even though the attack of pain is severe. In these cases distress is neither extreme nor lasting; the symptoms rapidly subside and the patient may feel well in twenty-four to forty-eight hours. The fall in blood pressure is not necessarily great, and the heart sounds are little, if at all, altered. In such cases the extreme care previously mentioned is not necessary. At the same time it is well to err on the side of caution and to insist on sustained rest for several weeks. During convalescence exertion must be very carefully graded by the degree of distress or exhaustion. Thereafter, treatment will be as outlined in the treatment of angina, taking all precautions to avoid strain, excitement and dyspepsia. Although the outlook for coronary thrombosis is fraught with danger and complications, it is very gratifying to find that even in most unpromising cases excellent recoveries sometimes occur.

M. D. SILBERBERG, M.D.,
Honorary Physician to In-Patients, Alfred Hospital, Melbourne; Visiting Physician to Repatriation General Hospital, Melbourne.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on April 26, 1934, in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, DR. A. J. COLLINS, the President, in the chair.

Low Back Pain.

DR. E. B. M. VANCE read a paper entitled: "Low Backache from the Orthopædic Point of View" (see page 707).

DR. J. G. EDWARDS said that the subject of low back pain was one of the most difficult that the meeting could be called upon to discuss; to the radiologist it was just as bewildering as to the physician and surgeon. His remarks would refer in a more or less general way to back pain apart from pain occurring in renal conditions; if the latter were included, it would make an already large subject too unwieldy to deal with in the few minutes at his disposal. He would give some figures which might be of interest, as they showed the numbers of cases of back pain that occurred.

During 1933, in private practice, 205 cases of low back pain had been investigated, in addition to 73 renal cases, while in the radiological department at the Sydney Hospital 572 cases of low back pain and 1,739 renal cases had been seen.

In the course of these 1,819 renal examinations many vertebral abnormalities had been met with; but it was impossible to dissect the figures and give details of these conditions; they had only been reported upon by the honorary staff when of peculiar interest; such conditions as *spondylitis deformans*, tumours, Paget's disease, and developmental anomalies, were frequently present.

The 777 cases of back pain might be roughly tabulated as follows:

No abnormality of spine or pelvis	356
Spondylitis deformans (hypertrophic type)	159
(atrophic type)	4
(Marie-Strümpell)	3
Osteitis deformans (Paget's)	2
Osteoarthritis of intervertebral joints	23
sacro-iliac joints	55
Fractures of vertebral bodies	28
transverse processes	16
sacrum and coccyx	17
pelvis	39
Diastasis of sacro-iliac joint	2
Tuberculosis of spine or pelvis	8
Malignant involvement	9
Osteomyelitis *et cetera*	6
Congenital defects, such as *spina bifida occulta*	12
Scolio-kyphosis without disease of the bodies	29
Lumbarization of first sacral vertebra	1
Sacralization of fifth lumbar vertebra	6
Spondylolisthesis	2
	777

Dr. Edwards went on to say that with the assumption of the erect attitude the lumbo-sacral region became the pivot-point of change, and from a concave curvature forward there had been a change to a convex one. This change had meant a tremendous readjustment in the bony and ligamentous structures and in the stresses and strains to which they were exposed. This region of the spine might be called one of normal abnormalities, and caution was necessary in radiographic interpretation. Many of these abnormalities were unassociated with pain or disability, and just because they were present they must not be looked upon as the causative factor; slight injury to these abnormal spines might cause trouble.

The difficulties in radiography of the spine were due to the vertebral bodies and intervertebral joints lying in different planes at the different levels; in examining this region, stereoscopic antero-posterior films and a good lateral film were to be desired rather than oblique radiography in various planes. One stereoscopic pair should be taken at the level of the umbilicus and one at the level of the sacro-iliac joints; in taking the upper pair a pillow should be placed beneath the knees.

Good lateral views were difficult to obtain; but if three and a half times the antero-posterior exposure was given, all other settings remaining constant, the film should be a good one.

Irregularities in the size and shape of the various bodies and their processes were common. The first sacral body might fail to unite with the rest of the sacrum (lumbarization), or the fifth lumbar body might unite, in part or wholly, with the first sacral segment (sacralization). The neural arches of the lower vertebræ frequently failed to develop, and the spinous process might be absent (*spina bifida occulta*), or again, the laminæ might be absent and the spinous process present as a separate ossicle.

At times an accessory articular process might be present at the lower end of the inferior articular process (especially of the second lumbar vertebra), and this was frequently mistaken for a fracture or loose body. Asymmetry of the transverse processes was the rule rather than the exception, and jointed transverse processes to the first lumbar vertebra were common.

Dr. Edwards said that in the time available it was impossible to deal with all the abnormal appearances in this region; they were of academic interest to the radiologist rather than to the profession generally. He would mention quickly and show illustrations of a few of the commoner lesions.

Spondylitis deformans appeared as a lipping of the vertebral bodies. It was a slowly progressive condition occurring in middle life, and though injury seemed to have little to do with its onset, yet injury might cause symptoms or aggravation of symptoms. Extensive bridging of the bodies occurred with alterations in their shape

and fibrosis and deformity in the disks. In the Marie-Strümpell type there was a complete fusion of the bodies with gradual extension of the ankylosis from below upward. This condition was probably of infective origin; the intervertebral disks were little affected.

Dr. Edwards remarked that spondylolisthesis was a slipping forward of some part of the spine. Its commonest site was at the lumbo-sacral junction. It was equally common in males and females—an argument against injury as a cause. It was usually associated with a separation or malformation of the lamellæ of the fifth lumbar vertebra, of congenital origin; this allowed a slipping forward of the spine at the lumbo-sacral level. Injury might not cause this condition; but it certainly aggravated it. In old-standing cases a bridge of supporting bone might grow from the upper margin of the sacrum.

Fractures of transverse processes were the result of muscular action. Any number might be fractured, and once separation of fragments had occurred there was little chance of bony union. Non-union was of little moment, as perfect function could be regained without it. Compression fractures might occur at any level. They could usually be seen clearly in the lateral views; fractures with only slight compression might be easily missed, especially if only antero-posterior films were taken.

Dr. Edwards went on to say that the sacro-iliac joint was a vulnerable one. The joint was a strong one, with powerful ligamentous supports, but with no control by muscles. There was little movement in this joint; but repeated strain might lead to laxity of ligaments; this, however, could not be demonstrated radiographically. Severe injury might cause a diastasis of this joint; such a lesion was always associated with fracture of the pelvis or separation of the *symphysis pubis*.

Dr. Edwards said that the intervertebral disk had been the subject of much recent investigation. The part played by the *nucleus pulposus* had caused much speculation. It was now generally considered that this acted as an hydraulic shock absorber, and injury to it might be followed by erosion and fibrosis of the disk. This was particularly the case in the disk between the fifth lumbar and first sacral bodies, and a narrowing of this space was seen in lateral views and was an associate of back pain. Osteoarthritic changes in the intervertebral joints were difficult to demonstrate; but they did occur, and were invariably associated with back pain. These joints were subject to great strain in even the simplest movements. An injury would cause spasm and jamming of the joint surfaces together, with increase of pain and spasm, which only disappeared after fixation and rest. Kümmell's disease of the vertebral bodies, *osteochondritis vertebralis*, was really a late stage of injury. Incomplete compression fractures of the bodies could easily be missed on a skiagram, especially in the dorsal region, and many months after the injury the body would be found atrophied and shrunken. Among other conditions there was tuberculosis, in which the lesion was a destructive one, commencing as a rule in the anterior part of a vertebral body; it might involve more than one body. The weakening of the body caused a collapse and a kyphosis. Syphilis was a destructive process associated with a disordered production of irregular bone; this might be considerable.

Malignancy in the spine was generally a secondary deposit. It might, however, be a direct extension of the process from a neighbouring area. Secondary breast carcinoma gave a worm-eaten appearance to the bodies, while secondary prostatic malignancy gave a condensed appearance to the bone.

Dr. Edwards remarked in conclusion that whenever back pain was present and there was no radiographic evidence of disease, the teeth should always be examined for possible septic foci. All crowned and pivoted teeth should be radiographed, and should be extracted: (i) when there was a periapical septic focus, (ii) when more than half the supporting alveolus was destroyed, (iii) when sepsis had extended between the roots of a molar tooth.

DR. LENNOX TEECE said that all those who had been doing orthopædic work for years must believe in the existence of sacro-iliac pain; it was a very real entity. The difficulties of diagnosis were great and the subject was rendered more obscure by the large number of cases of neurotic, hysterical or malingering type. Nevertheless there were many people with true sacro-iliac joint conditions. The literature on the subject was confusing. But there was one outstanding feature which enabled the medical practitioner to make an accurate diagnosis, not in early or slight cases that cleared up quickly, but in any moderately severe sacro-iliac joint strain that had persisted for from six to eight weeks—and this feature was pain along the course of the sciatic nerve on that side with atrophy of the thigh and calf. The presence of this symptom would lead to a correct diagnosis.

No consideration of low back pain was complete without reference to industrial surgery and the Workers' Compensation Commission. Dr. Teece referred to the cross-examination in court of wharf labourers. When questioned as to the treatment they had received they would say that the spine had been manipulated under anæsthesia. When asked if their condition had thereby been improved, they would say: "Yes, 100%"; but when further asked if they were ready to go back to work, they would say: "Oh, no"—they were in constant agony night and day. Dr. Teece had found that in workers' compensation cases the results of manipulation of spines were universally disappointing. When the question of compensation entered into the case, the patient was never improved by manipulation under anæsthesia. Dr. Teece admitted that he had performed manipulation himself, with shame and behind closed doors; not because he thought it did much good, but for its psychical effect on the patient, just as patients with hysterical hip and knee joints were frequently cured by a little legitimate charlatanism combined with manipulation under anæsthesia. But where low back pain was concerned he could see no purpose in manipulation. There were, however, cases of gross dislocation in which reduction might be brought about by early manipulation. Still he failed to see the rationale for manipulation at any later stage.

Dr. Teece wished to join issue with the speakers concerning Kümmell's disease. He did not believe that it existed. He quoted a case in which Dr. Edwards had examined with X rays for him the spine of a man who had sustained an injury. The man had been in hospital six weeks previously and his spine had been examined by X rays six times without any fracture's being revealed. Then Dr. Teece noticed some prominence of the twelfth vertebral body, and in the X ray picture a fracture was discovered. If the picture had been taken two years after the injury, instead of ten weeks, the patient would have been told that he had Kümmell's disease. Dr. Teece was sure that Kümmell's disease was an undiagnosed fracture of the vertebral body.

Orthopædic surgeons were accustomed to the sneering of other medical practitioners in regard to plaster jackets. There was something to be said both for and against their use. They had no doubt been used in error when a neurosis was the sole factor in pain in the back; and in such cases they would be harmful. But more often cases were seen of definite fractures of vertebral bodies, when the patient was given five or six weeks' rest in bed and then allowed his normal activity. Without the support of a well applied plaster jacket these patients did undergo a settling down of the vertebral bodies followed by back pain.

In conclusion, Dr. Teece spoke of the high incidence of low back pain and stressed the fact that this might more often than was thought be due to missed vertebral fracture.

DR. H. A. RIDLER referred to a paper in *The British Medical Journal* by Russell Andrews, who had put the subject very well. He maintained that the most common cause of low back pain was tiredness. In their work women complained of backache; this was not due to retroversion of the uterus or other gynæcological causes, but was purely because they were doing too much.

DR. J. C. STOREY said:

A wise old owl sat in an oak,
The more he heard the less he spoke,
The less he spoke the more he heard,
O why can't I be like that wise old bird?

and thereupon called on Dr. George Bell to speak on behalf of the surgeons.

DR. GEORGE BELL said that the subject was one of great interest to the general practitioner. There were a great many patients with low back pain, the majority of them women. Some were women who after childbirth got up too soon, and the cause of their pain was really muscular strain or imbalance. Patients among the poorer classes probably went on having backache.

In regard to missed fractures of the vertebral body, Dr. Bell thought that they were not so frequently missed now, since radiologists could get such a good lateral view of the spine. He could remember cases in which there had been injury to the back, with severe pain, but no obvious deformity. The patients would leave hospital and some months later show a definite kyphosis.

Dr. Bell felt sure that sacro-iliac strain did exist. Dr. Bell mentioned separation of the *symphysis pubis*, as when a man was thrown on the pummel of his saddle.

Dr. Bell had not seen many operations for this condition, but had read of bone grafting and other procedures. He thought that if minor measures failed, a small percentage of patients might justifiably be operated upon. But he agreed with Dr. Vance that they should be chary of doing operations and should perform them only after more conservative methods had been tried.

DR. D. J. GLISSAN thought it only right, since the obstetrical and gynæcological section should be represented, to make a few remarks in defence of their attitude. Some time ago, he had, on behalf of the Section of Orthopædics, read a paper on this subject; and on this occasion Dr. Worrall had given it as his opinion that most pain in the back of women was not gynæcological. Dr. Ridler was right in what he had said. Dr. Glissan himself labelled this condition "housewives' back", though it might also be called muscular imbalance or tired back; but the cause was definitely muscular. It should be remembered that the upright position was maintained subconsciously by voluntary muscle, and that when the muscle was fatigued pain resulted.

In regard to the question of manipulation, Dr. Glissan said that if on examination he found evidence to convince him that manipulation was needed, as when adhesions were present, then he had no hesitation in manipulating, because he thought it was the right thing to do. But it should not be done empirically. When rigidity followed upon adhesions due to direct trauma involving muscle, then manipulation would give a fair proportion of cures.

Some years ago, at an Australasian Medical Congress, they had been astounded to hear a surgeon of another State announce that he had fused sacro-iliac joints in seventeen patients for sacro-iliac strain. In a hasty computation Dr. Glissan and his colleagues, Dr. Meehan and Dr. Teece, could between them muster only five or six operation cases from probably a far greater number seen. This raised the point whether sacro-iliac strain, with subluxation, was a definite entity. He believed that it was; but it was mostly slight, and only sometimes would operation be required. Most cases yielded to conservative treatment. In fourteen years Dr. Glissan had fused the sacro-iliac joint in one patient only for sacro-iliac strain, because prolonged conservative measures had failed; the patient had returned to work and made a good recovery, which had been maintained over six years. He had fused a number of sacro-iliac joints, but not for sacro-iliac strain.

Dr. Glissan was not convinced that spondylolisthesis should not be included amongst congenital deformities. In practically every case there was evidence of some congenital structural defect, mostly *spina bifida occulta*. Most cases seen were slight, but in one he had seen severe displacement anteriorly of the fifth lumbar vertebra. The result was deformity and loss of function. If in the deformity there was definite evidence of failure of development of bone structure, it was reasonable to postulate corresponding failure of development of ligamentous structures.

Finally, Dr. Glissan referred to osteoarthritis and said that nothing would convince him that it was more than an age change, like grey hairs and wrinkles. There was ample clinical evidence that osteoarthritis *per se* was not painful until some other factor was superadded; it was this factor that had to be determined and treated. Dr. Glissan agreed with Dr. Vance that osteophytes, though they were an attempt at repair in response to the erosion that took place, were not sufficient cause for back symptoms. Osteophytes of this kind had to be differentiated from what appeared to be fused osteophytes. The latter, seen in the infective types of spondylitis, resulted from a calcification or ossification in the ligaments, and the two conditions had to be clearly distinguished.

Dr. Glissan had been interested to see that in Dr. Edwards's table there were only two cases of Paget's disease. He had the impression that Paget's disease was a fairly common cause of low back pain.

DR. H. R. SEAR said that the methods of keeping statistics in hospitals should be improved. He had found in the records of a large hospital only one case of Paget's disease recorded during a whole year, whereas he himself saw five in one week in the same hospital. Hospital statistics were erroneous because no cross index system was used. Dr. Sear mentioned another hospital in which every skiagram taken was put down as a patient; in this way there would appear to be fourteen or sixteen cases of some rare disease in one year, when there was really only one. He should like to see better hospital records. In regard to Kümmell's disease, Dr. Sear was very much of Dr. Teece's opinion.

DR. JOHN HOETS expressed his appreciation of the papers. Dr. Vance had given his usual carefully thought out and excellent address to which few could take exception. The same could be said of Dr. Edwards's collection of X ray pictures. The only fault he could find was that Dr. Edwards went at his usual pace and did not give them time to see the finer points. He had been particularly interested in one picture showing additional articular processes of the vertebræ. He thought that Dr. Ridler had put his finger on the spot in his description of the most common cause of backache in women. The same was true in men, though the cause was not the same. When a man had suffered from an infection and began work again before he was fit, he would complain of backache and of his feet. The same thing happened commonly with women after a confinement; their feet gave way and they suffered from backache. There was naturally a weakening of the whole musculature after an illness. But after reeducation and appropriate treatment the symptoms would disappear.

Dr. Vance had avoided mention of the old subluxation of the sacro-iliac joint. Dr. Hoets scarcely dared to mention it, since it was commonly held not to occur; but he wondered whether it did not occur. He spoke of a man who had had pain for many months. He had manipulative treatment without effect. Later on he stepped off the curb and experienced a jar and a snap, and the pain was permanently relieved. A second man with joint pain had been suspected of malingering; one day, when the patient was being manipulated, something snapped and the pain disappeared and did not recur. Dr. Hoets thought that subluxation might be a real entity.

Lumbo-sacral pain might occur fairly frequently. He agreed with Dr. Glissan that spondylolisthesis was originally congenital, but frequently trauma would cause symptoms. Dr. Hoets spoke of the difficulty of controlling the condition with apparatus on account of the position of the lesion. Long rest was the chief treatment. Fusion operations might give good results; Dr. Hoets preferred Hibbs's to Albee's method of fusion.

DR. ARCHIE ASPINALL said that he had come to learn and had done so. In regard to what Dr. Teece had said concerning malingering, Dr. Aspinall said that in the out-patient department at Sydney Hospital before the days of workers' compensation he had found many men with

pain in the back who had nothing to gain by being off work. The prescription of five grains of potassium iodide with salicylate of soda seemed to do good. He considered that the pain was very genuine in working men.

Dr. Aspinall spoke of motor driving as a possible cause of low pain in the back. Taxi-drivers complained of it. No doubt a fair proportion of it was due to constipation and congestion of the prostate, both of which might be partly due to sitting in a faulty posture.

DR. T. W. LIPSCOMB expressed a desire to throw a spanner into the works. He and Dr. Lawes were possibly the only two members present who were old enough to have had experience in industrial areas before the time of workers' compensation. In those days there was no such thing as a low back problem; and if it was complained of, it could be cured by potassium iodide and salicylates. But now it was a different matter. Orthopædic surgeons arose and persuaded radiologists to take X ray pictures; *spina bifida occulta* and other congenital alterations of no significance were found and the low back problem came into being. Dr. Lipscomb thought that this problem had been aggravated by the over-attention given to it since workers' compensation came into force.

DR. S. H. SCOUGALL pointed out that low back pain was common apart from the industrial class. Dr. Vance, among his causes of this pain, had given postural disabilities. A type often missed was the pain in the low back occurring early in scoliosis, when the scoliosis was very difficult to recognize. Dr. Teece had said that he could see no rationale for manipulation in low back pain. Dr. Scougall said that when he found a joint limited in movement in a given direction and free in another he suspected an adhesion. Low back pain was frequently accompanied by a contralateral relief stance; after a time a shortening of some muscles and an elongation of others occurred, and adhesions formed, following trauma or inflammation. In such circumstances the patient should first be subjected to corrective plaster and should be thrown well over in the opposite direction. Excellent work had been done along these lines, by Haglund in Stockholm, in low back lesions leading to sciatic scoliosis. Corrective fixation was maintained for four to six weeks. In many cases this saved manipulation.

DR. A. R. HAMILTON added his thanks to Dr. Edwards and Dr. Vance. The question of manipulation seemed to be the chief point of difference. He was sorry that Dr. Teece did not agree with it, since he thought that it was of definite use. Manipulation *per se* was not enough; it must be followed by exercises, which were essential to insure success. Dr. Hamilton said that he had seen and obtained gratifying results from manipulation.

In regard to fusion in sacro-iliac strain, Dr. Hamilton said that in Boston there were two schools of thought, one that fused and one that did not; each failed to see any justification for the other's views. In conclusion, Dr. Hamilton said that in his opinion manipulation, exercises and a belt would cure most cases of sacro-iliac strain.

DR. A. J. COLLINS added his congratulations to those of the other speakers. The papers had been excellent and informative. He also wished to congratulate those who had contributed to the stimulating discussion.

Dr. Vance, in reply, said that the suggestions and thoughts thrown out had been very helpful to him. He realized that no list of causes of low back pain should have been made without including Paget's disease in Australia. He should like to defend at greater length the procedure of manipulation which Dr. Teece had challenged. He noted that at first he had been asked to discuss the subject of low back pain from the orthopædic point of view; but apparently there was no orthopædic point of view. They were evidently not a glee club.

Dr. Edwards, in reply, said that he was sorry he had not included some mention of Paget's disease in his paper. He had come across many cases in fifteen to twenty years, but had found them rather in the course of renal examinations than examinations for low back pain. As to a cross-indexing system of keeping statistics in hospitals, Dr. Edwards thought that it was chiefly a matter of expense. It would take two extra people to carry this out in any large hospital.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Royal Alexandra Hospital for Children on April 16, 1934. The meeting took the form of a series of clinical demonstrations.

Osteomyelitis of the Femur.

DR. P. L. HIPSLEY showed a boy, aged ten years, who had been admitted to hospital on January 23, 1934, with a history of pain in the right thigh for five days. He was unable to walk. X ray examination on admission revealed no abnormality.

On January 23, 1934, the right hip joint was exposed at operation. Clear fluid escaped from the joint. The femur was drilled through the great trochanter. No pus was found. The wound was drained by a tube. On January 25, 1934, the wound was reopened and free pus was found. At the same time the left elbow was opened and no pus was found. A culture of *Staphylococcus aureus* was made from the blood. On February 24, 1934, the left elbow joint was opened and pus was found. On February 23, 1934, X ray examination revealed osteomyelitis of the upper end of the right femoral shaft, a small sequestrum in the neck, and two or three small pieces separated from the great trochanter, osteomyelitis of the lower end of the left humerus, with a small sequestrum; a further focus ten centimetres (four inches) above the elbow.

Dr. Hipsley also showed a male patient, aged three and a half years, who had been admitted to hospital on February 20, 1934, with a history of pain in the right thigh for two weeks, accompanied by fever.

On February 20, 1934, an incision was made in the front of the right thigh. A large amount of pus was found under the quadriceps muscles. The upper third of the femur was bare. The joint contained pus and the head of the femur was loose. *Staphylococcus aureus* was grown from the pus. A Hamilton splint was applied on February 23, 1934.

X ray examination on February 20, 1934, revealed osteomyelitis of the upper third of the femur with a fracture through the neck; some upward displacement of the shaft. The joint surface was not involved. X ray examination on March 5, 1934, showed that the condition had extended along the shaft; the head was in good position. On April 9, 1934, there was a slight extension along the medial aspect of the shaft; the diaphysis was again displaced slightly laterally.

Tuberculosis of the Left Hip Joint.

Dr. Hipsley's next patient was a boy, aged five years, who had been admitted to hospital on December 27, 1932, with a history of pain in the left hip and limitation of movement for one week, following a fall from a veranda. At the time of admission the temperature was normal. There was no familial history of tuberculosis. The patient reacted to the von Pirquet test. X ray examination on December 28, 1932, revealed no bony lesion; on January 27, 1933, slight transradiance of the outer part of the epiphysis of the femoral head, possibly early tuberculosis; on April 6, 1933, no bony lesion. The child was kept on a Hamilton splint till March, 1933, and was discharged on May 6, 1933. He was readmitted on January 6, 1934, with a history of further trauma to the left hip. X ray examination on January 22, 1934, revealed an area of transradiancy in the lower part of the left iliac bone, suggesting an early tuberculous lesion.

On April 9, 1934, the area in the left ilium near the acetabulum was larger, but better defined. A double Hamilton splint was applied.

Tuberculosis of the Spine.

Dr. Hipsley also showed a male, aged ten years, who had been admitted to hospital on January 19, 1929, with

a history of a "bad spine" for three years, night sweats, and incontinence of urine and fæces. He was unable to talk well. X ray examination revealed tuberculosis of the thoracic spine, involving the third to the seventh vertebræ. There was much destruction with collapse of the vertebral bodies. A large chronic abscess was present. At X ray examination on April 23, 1931, the lesion appeared to be stationary. On December 13, 1932, a spontaneous fracture of the femur occurred. On December 29, 1933, X ray examination revealed that bony union was taking place, with marked callus formation; the spine lesion appeared to be stationary.

Periostitis of the Right Ankle.

Dr. Hipsley's next patient was a boy, aged six years, who had been admitted to hospital on March 26, 1934, with a history of having run thorns into his ankle about five months previously. The ankle had been swollen for some time. He had injured the ankle again three weeks before admission. The child limped slightly and complained of pain. X ray examination revealed evidence of osteomyelitis, with minute sequestra. There was no reaction to the von Pirquet or the Wassermann test.

Cystic Goitre.

Dr. Hipsley's last patient was a boy, aged seven years, who had been admitted to hospital on April 7, 1934. The child was said to have been born with a swelling of the thyreoid gland. The swelling had become larger during the three or four years prior to admission, when it had become stationary. There was no breathlessness or palpitation. One sister, aged eighteen months, had a goitre. The child came from Cessnock, New South Wales. There were 3,800,000 red blood cells and 6,300 leucocytes per cubic millimetre of blood; the hæmoglobin value was 57%; a differential count revealed 44% of polymorphonuclear leucocytes, 50% of lymphocytes, and 6% of monocytes.

Thyreoid extract, in a dose of 0·09 gramme (one and a half grains) a day was given.

Multiple Tuberculous Lesions.

DR. F. C. ROGERS showed a girl, aged five years, who had been admitted to hospital on December 15, 1930. There was a previous history of measles, pertussis, pyelitis, diphtheria and bronchopneumonia. Six weeks before admission the child had complained of pain in the left foot, suspected of being rheumatic; but the lesion progressed and the foot became more swollen, until the patient could not walk. There was no constitutional disturbance; but the joint felt very hot. There was no family history of tuberculosis.

The left ankle joint was opened on account of probable suppurative arthritis, and pus was found. Attempts at culture were fruitless; tubercle bacilli were not found. On December 17, 1930, the child reacted to the von Pirquet test with both human and bovine tubercle bacilli. On December 18, 1930, X ray examination revealed infective osteitis or osteomyelitis of the posterior half of the talus, probably tuberculous; a slight suspicious translucency on the antero-lateral margin of the lower end of the shaft of the tibia.

On January 31, 1931, the child was sent to the hospital's convalescent home at Collaroy. On February 9, 1931, the left knee became swollen; X ray examination revealed some suspicious irregularity of density in the upper tibial epiphysis of the left leg and evidence of infection of the left talus; it was considered that these infections were probably tuberculous. There was a discharging sinus from the operation incision in the left ankle, which was still draining. A back splint was applied, and the child appeared comfortable.

On February 26, 1931, plaster was applied to the left leg and the child sent back to Collaroy.

On April 9, 1931, the ankle again broke down and the plaster had to be removed. On December 28, 1932, and March 3, 1934, Calot's fluid was injected into the ankle. X ray examination on April 11, 1931, revealed slight, yet definite advance in the ankle; more erosion of the articular surface; very slight advance in the knee.

On September 17, 1931, X ray examination still revealed active and progressive disease, evidently tuberculous, affecting the talus and extending to involve the lower epiphysis and lower end of the shaft of the tibia. The lesion of the upper end of the tibia appeared to be arrested; there was some bone regeneration at this situation.

The child had trouble with her right ear, and on October 22, 1931, her tonsils and adenoids were removed.

On April 20, 1932, evidence of new bone formation was observed by X ray examination; the general appearances suggested that the lesion was now chronic, but still active.

On several occasions in 1932 Calot's fluid was injected into the left ankle, which appeared to be slightly improved. During this time the child was having treatment for a discharging ear. On August 15, 1932, X ray examination revealed that both mastoids were acellular; no osteomyelitis of the mastoids was seen.

On March 30, 1933, an active tuberculous lesion in the head of the tibia, with a large area of necrosis and several sequestra, was revealed by X ray examination. At a further X ray examination on May 31, 1933, the condition appeared to be advancing; there was new bone destruction in the ankle and knee.

At this time the child had her left leg held in flexion at the knee. The knee was very swollen and irregular, the ankle was swollen and had no movement. There were sinuses on either side of the ankle. The child was put on a Hamilton splint. On October 7, 1933, X ray examination revealed a slight, yet definite, advance in the disease of the ankle. While the child was lying in bed it was noticed that the right hip appeared to be displaced and was painful on movement, and on December 7, 1933, radiological examination revealed destruction of the acetabulum and the head and neck of the right femur, which had travelled upwards and was almost certainly tuberculous. The child was put on a double Hamilton splint with extension to the right hip. The left ankle was still discharging freely. On January 23, 1934, there were 1·9 centimetres (three-quarters of an inch) of shortening of the right leg. At X ray examination on March 17, 1934, the femoral head was in good position; there appeared to be a slight advance in the disease process.

On April 17, 1934, a firm, semi-elastic, cold, painless tumour was noticed on the posterior aspect of the right gluteal region, suggesting a cold abscess.

Dr. Rogers stressed the fact that the lesions of the knee and hip had commenced after the child's admission to hospital and while she was at rest in bed.

Perthes's Disease.

Dr. Rogers's next patient was a male child, aged five years, whose parents had noticed, in December, 1933, that he had a right-sided limp. This became progressively worse; but there was no pain at any time. There was no loss of weight, sweating, or night starts. There were no signs or symptoms of constitutional disturbance.

On February 27, 1934, X ray examination revealed well marked Perthes's disease of the right hip joint. There was no reaction to a von Pirquet test done on March 3, 1934. The patient was put on a Hamilton splint, on which he was perfectly comfortable.

Osteomyelitis of the Hip.

Dr. Rogers next showed a boy, aged seven years, who had been admitted to hospital on February 6, 1934. For about four days before admission he had suffered from pain in the left hip, worse at night and aggravated by movement. The child held the left leg flexed and abducted. There were signs and symptoms of a severe constitutional disturbance. A diagnosis of acute osteomyelitis of the upper end of the left femur, with septic arthritis of the hip joint, was made, and operation was performed at once.

The left hip joint was opened from the posterior aspect, and septic arthritis was found. The joint was drained and the child placed on an interrupted Hamilton splint. Streptococci were cultured from the pus. On February 10, 1934, extension of 1·8 kilograms (four pounds) was applied to the left leg. There was hectic fever until March 7, 1934,

and up to this time pus was freely discharging from the operation incision. The limb was kept in a good position on the Hamilton frame, and no evidence of any metastases appeared.

X ray examination on March 16, 1934, revealed appearances suggestive of early osteomyelitis of the neck of the left femur.

The temperature settled down and remained about normal until March 23, 1934.

The discharge from the wound became much less and the child's general condition was vastly improved. The temperature settled down and remained about normal till March 23, 1934, when a low irregular fever became evident. The splint was being left off the leg during the day and reapplied at night for a few days. A hard, tender, brawny swelling slowly developed over the upper end of the front of the left thigh; but there was no definite fluctuant mass. This indurated swelling was still present at the time of the meeting, but appeared to be slowly resolving. The fever and pain had settled down.

Dr. Rogers's next patient was a girl, aged twelve years, who had been referred from Molong on February 16, 1934. On July 1, 1933, she had complained of severe pain in the right hip and had a temperature of 38·9° C. (102° F.). She had given a history of a fall some days previously. The pain had lessened and the fever had subsided very quickly with foments and salicylates. On July 10, 1933, the pain had become severe again and she had been sent to hospital. X ray examination had not revealed any abnormality of the hip joint or femur. A Thomas hip splint had been fitted and salicylates continued. On August 18, 1930, further X ray examination had revealed marked rarefaction of the bone in the neck of the femur, but no joint lesion. A good deal of induration and redness had been present on the outer end of the thigh, and on August 21, 1933, an incision had been made through the infiltrated tissue and continued just posterior to the great trochanter. The posterior surface of the neck of the femur had been scraped with a spoon and a small fragment of bone had come away. The fever and pain had disappeared next day. On September 23, 1933, the splint had been removed and a good range of movement without pain in the right hip joint had been noted. There had been some *coxa vara* and lordosis. On February 11, 1934, there had been more pain in the thigh and some induration on the outer side of the thigh. X ray examination on February 12, 1934, had revealed marked disease of the right hip joint, and the child had been referred to the Royal Alexandra Hospital for Children for further investigation.

By X ray examination it was found that extensive destruction of the right acetabulum and head of the right femur had occurred; this was regarded as osteomyelitis, probably tuberculous; changes were present in the right ilium and in the shaft of the right femur—possibly mainly disuse atrophy.

There was no reaction to the von Pirquet test. The child was able to walk, and for the previous three months she had been using crutches and had had no pain at all. She was gaining weight and had no night sweats or night starts. At the time of admission she was regarded as possibly suffering from tuberculous disease of the hip and was put to bed on a Hamilton splint.

On March 13, 1934, the von Pirquet test was repeated and there was still no reaction. The patient appeared to be very well in general.

On March 16, 1934, the splint was removed and the child allowed to move her limbs while still in bed, which she did without any trouble.

On April 4, 1934, there was very little noted in the X ray appearances. There was still no reaction to the von Pirquet test. The child was allowed to go about on crutches, and she appeared quite comfortable and had no pain on walking.

Dr. Rogers remarked that the condition was probably not tuberculous, because of the rapid onset, the quick healing of incisions, and the absence of the von Pirquet reaction on three applications of the test.

(To be continued.)

Correspondence.

THE MEDICAL SECTION OF BRITISH INDUSTRIES HOUSE.

SIR: As Chairman of the Medical Advisory Council of the Medical Section of British Industries House, I hope you will allow me to bring to the notice of your readers an enterprise which, we believe, will be of considerable interest to them.

When I was Medical Secretary of the British Medical Association, I was frequently visited by doctors from overseas who had been commissioned to buy furniture or apparatus for their hospitals, and who wished to know if there was any place at which they could see things under one roof. There was no such place; but at British Industries House there soon will be.

This institution, which is backed by a combination of six of the largest insurance companies in this country, is situated in a very large building at Marble Arch, Oxford Street, which was built for Messrs. Gamage, and, not being successful in their hands, was bought by the insurance companies. It covers a very large floor space and it is intended to offer to manufacturers and buyers a centre at which goods of exclusively British manufacture can be seen.

One floor will be reserved for medical instruments, drugs, and other goods suitable for medical men and medical institutions. It will not be open to the public, as it is intended to be a real business centre. It has the cordial support of many leaders of commerce in this country, together with the Department of Overseas Trade, and is already assured of the active participation of many of the chief manufacturers of British drugs, instruments and hospital requirements.

In establishing the medical section the directors appointed a small medical advisory council, consisting of Sir Crisp English, F.R.C.S., of Saint George's Hospital; Dr. E. P. Poulton, of Guy's Hospital; and Mr. A. R. Melhuish, a Past President of the Pharmaceutical Society of Great Britain, with myself, to guide them in making the section useful and attractive to the medical and pharmaceutical professions.

Doctors, pharmacists, and hospital managers, as potential buyers, will be admitted, on presentation of their card. The section will be opened on Wednesday, July 18, just before the opening of the annual meeting of the British Medical Association at Bournemouth, and further particulars will be announced later. Any of your readers who may be in this country will be welcomed at all times at the section. I feel sure that the project will be a useful one and will be warmly welcomed by all who have ever had to spend their time in journeying to various places in order to examine goods of British manufacture in which they are interested.

I enclose a copy of the booklet describing the building and its objects.

Yours, etc.,

ALFRED COX,
Chairman,
Medical Advisory Council.

British Industries House,
Marble Arch,
London, W.1,
April 11, 1934.

Obituary.

HENRY GEORGE CHAPMAN.

WE regret to announce the death of Dr. Henry George Chapman, which occurred on May 25, 1934, at Sydney, New South Wales.

Books Received.

PRACTICAL X-RAY THERAPY, by H. Davies, M.A., M.R.C.S., D.M.R.E.; 1934. London: J. and A. Churchill. Demy 8vo., pp. 142, with 47 illustrations. Price 8s. 6d. net.

RECENT ADVANCES IN SEX AND REPRODUCTIVE PHYSIOLOGY, by J. M. Robson, M.D., B.Sc., F.R.S.E., with introduction by F. A. E. Crew, M.D., D.Sc., F.R.S.E.; 1934. London: J. and A. Churchill. Demy 8vo., pp. 259, with 47 illustrations. Price: 12s. 6d. net.

DISEASES OF THE EYE, by J. H. Parsons, D.Sc., F.R.C.S., F.R.S.; Seventh Edition; 1934. London: J. and A. Churchill. Demy 8vo., pp. 703, with 21 plates and 353 text figures. Price: 18s. net.

THE INFLUENCE OF HEREDITY ON DISEASE, by L. S. Penrose, M.A., M.D.; 1934. London: H. K. Lewis. Demy 8vo., pp. 85. Price: 5s. net.

Diary for the Month.

JUNE 5.—Tasmanian Branch, B.M.A.: Council.
JUNE 6.—Western Australian Branch, B.M.A.: Council.
JUNE 6.—Victorian Branch, B.M.A.: Branch.
JUNE 7.—South Australian Branch, B.M.A.: Council.
JUNE 8.—Queensland Branch, B.M.A.: Council.
JUNE 12.—Tasmanian Branch, B.M.A.: Branch.
JUNE 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 19.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 19.—Tasmanian Branch, B.M.A.: Council.
JUNE 20.—Western Australian Branch, B.M.A.: Branch.
JUNE 21.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 22.—Queensland Branch, B.M.A.: Council.
JUNE 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 27.—Victorian Branch, B.M.A.: Council.
JUNE 28.—South Australian Branch, B.M.A.: Branch.
JUNE 28.—New South Wales Branch, B.M.A.: Branch.

Medical Appointments.

Dr. A. C. Ternes has been appointed Government Medical Officer at Portland, New South Wales.

* * *

Dr. I. M. K. Scott (B.M.A.) has been appointed a Certifying Medical Practitioner at Broadford, Victoria, pursuant to the Provisions of the *Workers' Compensation Act*, 1928.

* * *

Dr. H. J. Davis has been appointed Resident Medical Officer, District Hospital, Kalgoorlie, Western Australia.

* * *

Dr. T. C. Butler (B.M.A.) has been reappointed a Member of the Nurses' Registration Board, Tasmania, in accordance with the provisions of Section 3 of the *Nurses' Registration Act*, 1927.

* * *

The undermentioned appointments have been made in the Adelaide Hospital, South Australia: Dr. W. J. W. Close (B.M.A.), Honorary Assistant Surgeon; Dr. F. R. Hone (B.M.A.), Temporary Honorary Assistant Physician; Dr. I. A. Hamilton (B.M.A.), Honorary Assistant Pathologist.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xviii, xix

ANTI-TUBERCULOSIS ASSOCIATION OF NEW SOUTH WALES: Honorary Medical Officer.

AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Resident Medical Officer.

DEPARTMENT OF INSPECTOR-GENERAL OF HOSPITALS, ADELAIDE, SOUTH AUSTRALIA: Deputy Director; Lecturer in Bacteriology.

MARRICKVILLE DISTRICT HOSPITAL, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Surgeon.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. Officer of Health, District Council of Elliston. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 395, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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